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BUFFALO, OCTOBER 11-14

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THE INTERNATIONAL SANITARY CONFERENCE

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THE FACT THAT the Mohammedan religion spread through the Far and Near East, particularly those tropical portions of Asia which were endemic centers of such pestilential diseases as plague and cholera, and along the littoral both of the Mediterranean and Black Seas, influenced not only the political but the epidemiological history of Europe. Pilgrims coming to the holy places of Arabia from such endemic centers as the Valley of the Ganges and the Dutch East Indies were crowded upon vessels or traveled in caravans with no provision for sanitation or ordinary hospital care. At the holy places pilgrims from Southern Russia, Turkey, the Balkans and elsewhere were thrown into immediate contact with these infections under the terrible conditions, existing around the holy places, and they returned to their native countries carrying with them plague and cholera infections which were spread along the caravan, river and sea routes to Western Europe.

As early as 1852 an International Sanitary Conference was held in Paris and the following year a Congress on Hygiene and Demography was held in Brussels. At intervals of every few years other conferences to discuss the problem were held in the various capitals of Europe.

As early as 1881 the United States Government invited the maritime powers to meet for the purpose of considering an international system of notification as to the actual sanitary conditions of ports and places under the jurisdiction of such powers.

It will be recalled that little was known as to the etiology or epidemiology of diseases until the later decade or so of the Nineteenth Century, although there had long been established so-called quarantines against infected ports. The quarantine, however, as the name originally implied consisted only of detention and isolation with the occasional use of sunshine or sulphur fumes. It is not unlikely that the terrible burden imposed upon shipping by such restrictions was as great a factor in the calling of conferences as was the fear of disease.

With the introduction of steam propelled vessels and particularly with the opening in 1869 of the Suez Canal, the danger to Europe and the western hemisphere of the spread of such diseases was greatly increased.

HISTORY OF PRECEDING CONFERENCES

The later conventions, notably that of Vienna in 1897, and the conference called by this Government, had for their purpose not only the development of an international system of notification, but the formulation of international sanitary regulations. Conventions or treaties per-

* Surgeon General Cumming was chief of the delegation of the United States to attend the International Sanitary Conference in Paris, May, 1926.

taining to such regulations were signed at Venice in 1897 and at Paris in 1903.

At the beginning of this century, owing to the epoch making discoveries of Pasteur, Koch, Manson, Reed, Carter and others, knowledge of the spread of insect borne and bacterial diseases became more common. The conference of Paris in 1903 was proposed by the Italian government for the purpose of attempting to compile in one text the existing conventions with such modification as the progress of science, and the interests of commerce and the requirements of public health should indicate. This convention provided for the creation of the Office International d'Hygiene Publique at Paris, for the issuing of monthly bulletins of contributions from the signatory powers and for a Permanent Committee of the Office. The committee was to consist of one delegate designated by each of the signatory powers, and was to meet at least once a year. This was the first official international organization for public health. This agreement was the so-called International Sanitary Convention at Rome, December 9, 1907. Although called an International Sanitary Convention, as a matter of fact, this agreement was signed by only two countries outside of Europe, namely Brazil and the United States, though other western countries later entered into the agreement.

The principal purpose of the International Office, as stated in the organic bylaws, is "to collect and bring to the knowledge of the participating states, facts and documents of a general character concerning public health and especially regarding the infectious diseases, notably cholera, plague and yellow fever, as well as the measures to check these diseases."

All of these conferences were dominated chiefly by the fear of the introduction of disease into Europe and the provisions of the convention were dominated by European ideas and interests.

In 1911 another conference was called in Paris to revise the existing convention, when for the first time the rôle of the rat in the spread of bubonic plague began to be recognized. The convention, however, consisted of a series of compromises which resulted in a somewhat illogical document, particularly in those technical parts containing the definition of "healthy," "suspected," and "infected" vessels. The convention, too, more or less under the domination of the shipping interests of Western Europe, had as one of its main objectives the restriction of countries in their quarantine measures. The most notable example of this was an attempt to base the protective measures taken by any country solely upon the official statements of other signatory powers as to the existence or non-existence of disease within their territories. The United States very properly refused to sign the document without a reservation regarding this provision, which was illogical both from the historical and scientific standpoints. Spain made a similar reservation. Other countries refused to accept the convention with the reservation made by the United States until 1919.

EFFECT OF WORLD WAR ON SANITARY CONVENTION

Conditions, both diplomatic and epidemiological, resulting from the World War made necessary the rearrangement of this sanitary convention. In the first place, old governments had been destroyed and new ones created. In the second place, typhus fever, which had become almost unknown save as a historic disease except in small areas of the world, threatened to sweep over the whole of Europe and America, and indeed it did claim millions of victims in Eastern and Central Europe. To add to the difficulty of the civilized world Russia, from whose vast territory much of the cholera and plague of prewar times had spread into Western Europe, had stepped backward and had become a country without government and without those conditions

which allow the control of epidemiological diseases. She had become a feeder of evil, not only political but physical, for the rest of the world.

Under these circumstances it was natural that the importance of pestilential diseases should again loom large in the view not only of public health men but of diplomats as well. The League of Red Cross Societies was organized at Cannes in 1919 and an article in the Covenant of the League of Nations related solely to public health matters. The Permanent Committee of the International Health Office was thought by several of the representatives to be a suitable organ through which the health activities of the League should be executed. However, this country refused to join with the League of Nations, and with France blocked the effort to associate the Office with the League.

Encouraged largely by American experts and money the Health Section of the League of Nations was organized about 1923 and since that time it has developed a very useful and efficient epidemiological intelligence service as well as other valuable international public health activities.

Unfortunately, the International Health office, which had been established by the powers to serve as a center for the reception and dissemination of epidemiological intelligence, had failed to fulfill its functions. Indeed, its bulletin was in a large part a replica or copy of the intelligence gathered by the United States government through its medical and consular officers and published in its weekly Public Health Reports. This was due largely to two causes; first, there had been a mistake made by the French government in the selection of a head for the Office—an old retired diplomat, instead of a competent expert; and, second, the amounts contributed by the governments were insufficient. Several attempts were made to coordinate the efforts of the League and the Office, both in the interest of efficiency and economy, for most of the more important nations of the world were contributing to the support of both, and as a result the so-called Mixed Committee was organized to consist of representatives of both organizations. The committee, however, has been of little practical use.

In view of the fact that the Sanitary Convention of 1912, as previously stated, was not only illogical and inconsistent with modern knowledge, but did not even recognize typhus fever or smallpox or adequately recognize the rôle of rodents in plague, the French government had been urged for several years to call another conference to revise the convention. After several postponements the governments were invited to send representatives to an International Sanitary Conference to convene in Paris, May 3, 1926, as the result of which a new convention has been signed by representatives of over 60 powers. This historical background is necessary to the discussion of the 1926 conference.

It may be inserted parenthetically that at the Pan-American Conference held in Havana in 1924 the so-called Pan-American Code of Havana was signed. This was officially conceded to be a great improvement over any existing agreement of international character.

PERSONNEL OF 1926 CONFERENCE

The International Sanitary Conference convened in Paris, May 3, 1926, in the great banquet hall of the French Foreign Office, formerly the Palais d'Orsay. More than 60 governments and dominions were represented by 250 or more delegates. The delegations of the more important countries such as Germany, Italy, France and Great Britain were composed of both diplomatic and public health officials with shipping directors and other technical men as advisers. Generally speaking, the heads of the delegations were diplomats. The two leading countries, however, the United States and Great Britain, both had public health officials—in one instance the Surgeon General of the U. S. Public Health

Service and in the other, Sir George Buchanan, Senior Medical Officer of the British Ministry of Health.

It does not follow, however, that because the heads of the delegations were diplomats that they were necessarily ignorant of international sanitary matters. For instance, Ambassador Camille Barrere, head of the French delegation, was one of the men chiefly instrumental in the earlier international conferences and he has presided over four conferences, including the one held in Rome and the previous one in Paris. Some of the less important countries were represented by one delegate, who perhaps was simply Secretary of Legation, acting under instructions from his government.

QUESTIONS BEFORE THE CONFERENCE

After the formal opening by the Minister of Hygiene, Monsieur Barrere was chosen President of the Conference. The Conference was immediately divided into two commissions—one to deal with Part 1 of the convention, which is essentially international in scope, and the other to deal with Parts 2, 3 and 4, which relate to the East and Near East conditions and which are entirely out of date because of the diplomatic and territorial readjustments following the World War.

QUESTION ONE

The most important questions before the First Commission were, first, a decision as to the relations which should exist between the International Health Office and its Permanent Committee and the Health Section of the League of Nations. Enthusiastic advocates of the League were in favor of practical abolition of the Office, while others expressed uncertainty as to the permanency of any League organization and were opposed to the inclusion of the League in the general scheme. The controversy lasted over weeks and was finally closed by the unanimous adoption of the British, French and American viewpoint in which the sphere of activity of the Office is restricted to the diseases mentioned in the convention. But in so far as these diseases are concerned its duties are extended to include not only the collection and dissemination of epidemiological intelligence but the question of efficiency and activity of the signatory powers toward the elimination of these diseases from their ports. The Office is given full power to utilize the Health Section of the League of Nations and its branches, the Pan-American Sanitary Bureau and other similar organizations—so long as nothing be done in derogation of the Treaty of Rome—or to substitute any other body for the Office.

QUESTION TWO

The second fundamental question was whether there should be contained in the convention definitions of what constitutes an "infected" area or port and what conditions should obligate other powers to desist from continuing protective measures.

Briefly, the attitude and argument of such governments as those of Western Europe, whose territories are practically non-infectible and whose shipping interests are paramount, was that the action of any signatory power must be determined solely upon official information furnished by the suspected country. In this attitude they were supported by countries which are already endemic centers of disease, which have few shipping interests but who do not want any interference with their commerce. What may be called the American viewpoint, supported by Japan, Australia, Canada and other countries that have either home or insular possessions which are infectible and that maintain more or less efficient maritime quarantine, was: that the convention itself and the maritime quarantine procedure is in the last analysis intended to prevent the spread of disease; that it rests with each country to determine from the standpoint of measures to be taken in its ports what measures should be adopted and upon what basis they should rest. This attitude of the American government is based

upon some bitter experiences in the past and upon common knowledge that there are countries signatory to the convention which either owing to undue influence upon their health services or inadequacy of information, are not furnishing full information regarding the existence of disease within their territories.

The European group, led by Monsieur Velghe, chairman of the Permanent Committee, argued that all treaties rest upon absolute mutual international confidence. The other group, through the chief American representative, simply drew attention to the existence of armies and other national safeguards, showing the limitations of such theories. The two viewpoints were diametrically opposed. An attempt was made to compromise with an authorization for each country to take such steps as it deemed proper, provided satisfactory explanations were made to the suspected country. To this ambiguous provision the American delegation at this time, as in 1912, filed a reservation, as it did also upon a similar principle, which would compel the acceptance of certificates of fumigation, valid for six months, upon the statement of each country as to the efficiency of its own methods.

TREATIES AND PROVISIONS

The diplomatic problems of the second commission were those consequent upon the desire of countries already mentioned in the Near East to abolish any international control of their maritime quarantine and pilgrimages. With these diplomatic problems the United States was concerned only insofar as they affected its shipping. So serious did some of them appear that after the first meeting of that commission there was an adjournment for several weeks to permit the framing of informal agreements. These agreements resulted in two rather important provisions: First, the treaty between Holland and Great Britain, providing for a mutual control of the Great Kameran Island Quarantine which detains pilgrims in the Red Sea; and, second, an agreement between Egypt and Great Britain for administrative control by the latter of the Suakin Quarantine, guarding the cotton growing districts of the Sudan.

In view of the reported abuse by Turkey of the quarantine in the Dardanelles, an agreement was made to waive quarantine restrictions upon vessels passing through territorial waters without communicating with shore. The American and German governments inserted a provision exempting lock canals, such as Panama and Kiel. At the last moment, however, the Turkish government filed a reservation which practically made this provision useless.

THE CONFERENCE IN RETROSPECT

The technical part of the convention was a marked improvement upon previous conventions, but as to the definition of what constitute "healthy," "suspected," and "infected" ships and as to the procedure in each case, improvement is necessary or at least desirable.

The first commission, after its preliminary sessions, appointed four subcommissions to deal respectively with cholera, plague, yellow fever and the fourth to deal with the other infectious diseases such as typhus fever and smallpox. These commissions were to report the principles upon which the technical procedure was to be based. The full commission, however, influenced by shipping and other interests, did not in all instances follow the principles laid down by the subcommissions. The differences, however, are more apparent than real, save in a few instances.

Taking the convention as a whole, it is a decided improvement upon any previous international sanitary convention. When one considers the heterogeneous composition of the conference and the various degrees of intelligence and interests represented, the final text is good, for after all any international agreement has to be a matter of give and take and compromise. When one looked over the assembly with its varied interests, represented

by men of all degrees of intelligence, and realized that each delegation, however small or however little knowledge or interest it might have in international health matters or in shipping interests, had a vote with as much weight as the United States, Great Britain or Germany, one's faith in universal suffrage with its one-man-one-vote principle was apt to be somewhat weakened.

THE VALIDITY OF THE MEDICAL EXAMINER'S RATING

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OUR EXPERIENCE over a number of years provides sufficient evidence to substantiate the statement that one of the great problems in physical education has always been the adequate physical examination of boys and girls.

In an endeavor to solve the problem, our first methods called for a great number of very complete and painstaking measurements of the body, as well as an examination of the organs. Many of us have been guilty, at one time or another, of accepting the physical measurements of a man as indicative of his potential power. The tendency to emphasize the significance of anthropometry is still too prevalent. We should not be too willing to accept any such traditional scheme of measurements without first accurately determining the full validity of the theory by scientific experimentation.

When the scientific attitude reigns, there will be little difficulty in understanding that measurements tell nothing of the texture and quality of the parts covered, *i.e.*, how much is fat or bone and how much muscle, neither do they alone give any information about heart power, nor the degree of interdependence between nerve and muscle upon which power and efficiency so frequently depend. Again, we will be less likely to believe that all-round efficiency is determined by big biceps and the distance, measured by the calipers, from the olecranon process to the tip of the middle finger.

Anthropometric and other irrelevant data have been given a fair trial and found wanting. Therefore, we must seek elsewhere for a valid, accurate, and economical solution of our problem.

Today more than ever before, physical educators are interested in a satisfactory solution of this problem. We have learned to appreciate and believe, by that greatest of teachers, experience, that every individual possesses somewhere within an unknown equation which makes for power and efficiency.

TWO-FOLD PURPOSE OF STUDY

One purpose of this study is to investigate the economy and trustworthiness of a grandiose system of measurements as a means of determining power and efficiency. A second purpose is to invite the thoughtful consideration of physical educators of suitable ways and means in effecting a scientific solution of this problem from the standpoint of the "scientific procedure" in physical education.

The physical efficiency test, as it is commonly known, is the instrument which is being developed and perfected for the purpose of searching out and testing this unknown something which makes for general power and efficiency. In order to be valid it is obvious that such a test should consist of more than just a test of motor activity accomplishment. It should include a test of cardiac efficiency upon which the circulation is dependent, and hence life itself. It seems logical to

assume that such a test, other things being equal, would give an all-round efficiency rating and make possible scientific classification. In fact, there is abundant evidence to support this statement.

Mr. Metcalf of Oberlin College made a careful study of the various types of athletic activities and the different factors involved.[1] He computed the correlation between ability to run, jump, throw, climb and vault on the one hand and membership on athletic teams on the other. He obtained a correlation of .65 which is considered rather high and significant and means that a man's ability to make an athletic team is directly proportional to his ability to run, jump, vault, climb and throw. He also found that, as an athletic coach, it was a waste of time to consider any man as a candidate for varsity teams who did not rank in the upper 40 per cent of the group, as determined by such a test.

Dr. Sargent of Harvard University, in formulating his Physical Test of a Man, found that a vigorous athletic girl, being 67.5 inches in height and 152 lbs. in weight, jumped 20 inches above her head which was .300 of her height, did 253 foot pounds of work and had an energy index of 45.0. He found that this test was an excellent means for judging muscular power and efficiency.

Foster and Schneider have worked out cardiac efficiency tests. There are other tests in use, and also some in the making.

STATEMENT OF THE PROBLEM

The problem as selected was to make a study of the nature and significance of the great mass of measurements employed by the medical examiner, and to determine, as far as possible, the value of these measurements to the medical examiner in scoring the general power and efficiency of an individual. To what extent such an accumulation of data could be studied, digested, and interpreted by the examining physician in terms of all-round efficiency was a problem that demanded careful investigation, since its solution strikes at the very basis of one of the fundamental weaknesses of physical education.

It was also thought advisable to include, as a part of the study, the teacher's rating of an individual for the purpose of making a comparison with the medical rating.

With such a purpose in mind this investigation was begun—a desire to throw some scientific light upon the following questions:

(1) Can the examining physician intelligently interpret a great mass of anatomical and other relevant or irrelevant data and acurately score the general power and efficiency of an individual in terms of cardiac efficiency and motor accomplishment?

(2) If so, to what extent, and how does this score compare with that of a simple rating test based upon the teacher's judgment?

(3) What is the relationship between functional tests of cardiac efficiency and motor accomplishment?

When we have the answers to these questions, we will be in a position to determine the economy and trustworthiness of anatomical and other relevant or irrelevant measurements.

GROUP TESTED

The experimental group consisted of 60 boys from the Horace Mann School for Boys, New York City, ages 12 to 14 inclusive. The method of selection was to take every other boy from an alphabetical arrangement of the entire group of 12, 13 and 14 year old boys. The experiment was begun with a group of 60, but for various reasons, 19 of this number failed to take all the tests, and at the conclusion of the testing only 41 boys had qualified. The odd one was dropped to facilitate computation.

THE PHYSICAL EXAMINATION

The same medical examiner made all the physical examinations. The boys reported in the examining room without clothes. A complete set of scientific

instruments was available. The following data was taken on each subject:

Grade	Teeth, eruption
Age	Nose
Weight	Throat
Height	Adenoids
Height sitting	Tonsils
Girth chest, full expiration	Glands, cervical
	Glands, thyroid
Girth chest, full inspiration	Lungs
	Heart, rate before and after exercise
Lung capacity	
Strength, right forearm	Heart, condition
	Hernia
Strength, left forearm	Scar, vaccination
Hearing, right ear	Scar, operation
Hearing, left ear	Skin
Vision, right eye	Posture
Vision, left eye	Shoulders
Astigmatism, R., L. B.	Abdomen
Vision with glasses, R.	Spine
Vision with glasses, L.	Foot, right
Condition, right eye	Foot, left
Condition, left eye	Nervous condition
Speech defects	General condition
Teeth, caries	Nutrition, height
Teeth, tartar	Nutrition, weight

SCALE RANGE OF 1 TO 10

The scale used by the medical examiner in scoring each individual had a range from 1 to 10. Table I shows the raw scores, frequency, and scale scores. A glance at the table shows that the lowest score was 2, and the highest 9, with no 6 or 8 scores. Nineteen boys were scored 3 which gave a scale score of 44, 3 boys scored 7 with a scale score of 65, and so on through the list.

TABLE I

SHOWING THE RAW SCORES, FREQUENCY, AND SCALE SCORES OF GENERAL EFFICIENCY PER MEDICAL EXAMINER

Score	f	Ex.	½R	Sum Col 3 & 4	Col 5÷40	Scale Score
2	2	38	1	39	97.5	30
3	19	19	9.5	38.5	71.3	44
4	4	15	2	17	42.5	52
5	11	4	5.5	9.5	23.7	57
7	3	1	1.5	2.5	6.3	65
9	1	0	.5	1.5	3.7	69

Column 1 indicates the different scores. Column 2—frequency or distribution of scores. Column 3—number exceeding different scores. Column 4—one-half those reaching different scores. Column 5—those exceeding plus one-half those reaching scores. Column 6—those exceeding plus one-half those reaching scores divided by n=40, *i.e.*, total number of scores. Column 7—T—scale score per McCall [2].

TEACHER'S RATING

The next step in the testing procedure was to secure a general efficiency rating based upon the teacher's judgment. For this purpose, a sheet of directions and a rating scale were provided for each boy. They are included herewith and are self-explanatory.

GENERAL EFFICIENCY RATING OF

Name.....

Directions

1. The instructor who is best acquainted with the boy is asked to make this rating (physical instructor excepted).
2. Be guided entirely by your own judgment in scoring the subject. Do not consult anyone else.
3. Do not study too long over any one measure or child. Score the measure and proceed to the next.
4. Concentrate on one measure at a time. In scoring it, disregard all the rest.
5. Do not allow yourself to be influenced by generally favorable or unfavorable impressions. The subject may rate high in one measure and low in another.
6. It is essential that the boy be present when rating him.
7. Score each measure. Do not miss any.
8. This rating is for experimental purposes and will be held strictly confidential.
9. Use the following scale for scoring each measure:
   - 5—Perfect (not in true sense)
   - 4—Above the average, but not the best
   - 3—Average
   - 2—Below the average, but not the poorest
   - 1—Poorest

RATING SCALE

MEASURE	SCORE
1. Is his color good?	
Negative signs: 1. Pallor; 2. Flushed face; 3. Congested eyes (red or bloodshot)	
2. Is he active and vigorous?	
Negative signs: 1. Disinclination to play; 2. Lassitude; 3. Timidity; 4. Shuffling, inelastic walk; 5. Leaning against wall or desk	

3. Is his posture good?

Negative signs:
1. Slouchy
2. Stooping
3. Unequal height of shoulders
4. Flat foot gait
5. Toeing markedly out

4. Is his voice firm?

Negative signs:
1. Stammering
2. Poor articulation
3. Undue embarrassment
4. Undue emotion of any sort

5. Does the facial expression indicate good condition?

Negative signs:
1. Blank expression
2. Twitching of lips
3. Puffiness of face and hands
4. Mouth breathing
5. Squinting
6. Crossed eye

6. Does he show interest in things and people around him?

Negative signs:
1. Listlessness (Inattention)
2. Moroseness (Peevishness)
3. Solitary habits
4. Misbehavior

7. Is he nervous?

Negative signs:
1. Spasmodic movements
2. Irritability
3. Bad temper
4. Inability to hold objects well
5. Twitching of eye, face or any part of body
6. Nail biting
7. Perverted tastes

8. Is his growth and development about average for a boy of his age?

Negative signs:
1. Underdevelopment
2. Peculiar or faulty postures
3. Deficient weight
4. Excessive fat
5. Low endurance

Total Raw Score

The raw scores were scaled in the same manner as those in Table I. By such a procedure, it is possible to reduce different scores to the same unit of measurement, and this favors direct comparison. In Table II and following tables only the raw score, the frequency and the scale score are given. Columns 3, 4, 5 and 6 as shown in Table I may be easily computed by those interested.

TABLE II

SHOWING RAW SCORES, FREQUENCY, AND SCALE SCORES OF GENERAL EFFICIENCY PER SIMPLE RATING SCALE BASED ON TEACHER'S JUDGMENT

Score	Frequency	Scale Score
17	1	28
19	1	32
20	2	36
21	1	38
22	1	39
23	2	41
24	1	42
25	2	43
26	4	46
27	5	48
28	3	51
29	6	54
30	5	58
31	2	62
32	4	67

CARDIAC EFFICIENCY

There is sufficient evidence to prove that, other things being equal, cardiac efficiency is symptomatic of general power and efficiency. If there is cardiac inefficiency, there will be inefficient circulation which expresses itself in insufficient oxygenation of the body tissues and in insufficient removal of waste products. An undernourished and toxic condition of the whole organism results. It may be small or great, but the whole system is affected deleteriously and general power and efficiency are decreased.

Preliminary to testing for cardiac efficiency, each subject was given a careful heart examination by the examining physician, and all were passed as having normal hearts in so far as organic heart disease was concerned. The boys reported in the nude in the examining room for the heart test. The subject was made to feel at ease as much as possible and then the heart rate, in a standing position, was noted by means of a stethoscope for 15 seconds. The 15 was multiplied by 4 to get the rate per minute. The examiner explained to the subject how to run in place for 15 seconds, then he gave the commands to start and stop, and at once took the rate for 5 seconds, multiplied by 12, and repeated this operation every

15 seconds until the heart returned to normal, *i.e.*, the rate before exercise.

The method of scoring the test was to take the number of seconds required for the heart to return to normal as the raw score of cardiac efficiency. The results of the test are shown in Table III. An examination of the scores shows that the time required for the 40 hearts to return to normal ranges from 30 to 120 seconds. Three returned in 30 seconds and 5 required 105 seconds to come back to normal. The raw scores are scaled by the same method used in Table I.

TABLE III

SHOWING RAW SCORES, FREQUENCY, AND SCALE SCORES OF CARDIAC EFFICIENCY

Score	Frequency	Scale Score
120	2	30
105	5	38
90	7	44
75	7	48
60	10	54
45	6	60
30	3	68

MOTOR ACCOMPLISHMENT

The Sargent Physical Test of a Man was used to test motor accomplishment. The method followed in giving and scoring the test was the same as that used by Dr. Sargent.[3] The subject to be tested stood under a hitch-and-kick disk, suspended above his head. He was instructed to bend forward, flexing the trunk, knees and ankles, and then by a powerful jump upward, straightening the legs and spine, to try to touch the suspended disk with the top of his head. He was further instructed to swing the bent arms forward and upward at the time the legs, back, and neck were extended in order to secure the maximum height in the jump. When the disk had been placed at the highest point above the head of the subject so that he could just touch it in jumping, this height was measured. The difference between this height and that of the total stature of the subject represented the height actually jumped.

Kinesiology, the science of bodily movement, furnishes sufficient evidence to substantiate the theory that motor power depends upon the strength and skill of the muscles involved. In other words, motor accomplishment is directly dependent upon the use of the right muscles, at the right time, and with the right amount of force. The physical test of a man calls for just this sort of motor effort. Surely, motor accomplishment is indicative of general power and efficiency.

Consider, first, the work done in raising the body from the deep knee bend position to standing position. It can be best expressed by the formula:

$$\frac{\text{Weight x Half the Height}}{12} = \text{F.P.}$$

Consider, next, the amount of work done in projecting the body a certain distance into the air, above the height of the standing position. The formula for this as stated by Sargent is:

$$\frac{\text{Weight x Height Jumped}}{12} = \text{F.P.}$$

Consider, again, the ratio between height jumped and stature. A heavy weight individual will not jump as high as a light weight person, other things being equal, but is it not fair to expect a heavy built individual to jump in proportion to his height, and make this ratio, a basis for judging the motor accomplishment of all individuals, whether light or heavy?

Such was the basis for using the following formula as a means of obtaining the motor accomplishment index:

$$\text{M.A.} = \frac{\text{Height Jumped x Weight}}{\text{Total Stature}}$$

TABLE IV

SHOWING RAW SCORES, FREQUENCY, AND SCALE SCORES OF MOTOR ACCOMPLISHMENT PER SARGENT'S PHYSICAL TEST OF A MAN

Score	Frequency	Scale Score
11	1	28
15	4	36
16	2	40
17	1	41
18	4	43
19	4	46
20	6	49
21	4	53
22	4	55
23	5	59
24	1	62
25	2	65
28	2	70

With these data in hand tables were

prepared showing the relation between the various observations and the coefficient of correlation was figured for each pair of observations by the Product Moment Method per McCall.[4] These coefficients with their probable error were found to be as follows:

Motor Accomplishment and Cardiac Efficiency

r=.46 P.E.=±.084

Medical Rating and Cardiac Efficiency[5]

r=.093 P.E.=±.107

Medical Rating and Motor Accomplishment

r=—.054 P.E.=±.106

Teachers' Judgment and Cardiac Efficiency

r=—.14 P.E.=±.101

Teachers' Judgment and Motor Accomplishment

r=.32 P.E.=±.093

COMMENTS AND CONCLUSIONS

A careful study of the results of these computations leads to a statement of several significant facts and conclusions.

A correlation of .093 between the medical examiner's rating and cardiac efficiency is practically no correlation at all. There is a similar lack of correlation between the medical rating and motor accomplishment. These facts lead to the first conclusion: That the validity of the medical examiner's rating is unquestionably doubtful, and in all probability highly inaccurate, when such a rating is used to interpret the general power and efficiency of an individual in terms of cardiac efficiency and motor accomplishment.

Careful study, close observation, and intelligent questioning on the part of the experimenter, of methods and materials used in obtaining the examination data with the resulting interpretation of the same, lead to the second conclusion: That the medical examiner, like all other physicians, is primarily concerned with the detection and remedy of pathological conditions; that it is the physician's chief business to be interested in the sick and defective, and only concerned with the well individual as a matter of course. The *modus operandi* seems to be that of making a cold blooded analysis of the subject, calling for the utilization of an immense number of measurements and observations, relevant and irrelevant, in an honest attempt to discover some symptoms of organic irregularities. Failing to locate any such signs, he is lost, as far as making any scientific study and ultimate interpretation of this great mass of data in terms of general power and efficiency.

A correlation of —.14 between the teacher's judgment of general efficiency and cardiac efficiency and a correlation of .32 between the teacher's judgment and motor accomplishment warrant a third conclusion: That the teacher's judgment, in the absence of pathological conditions and defects, is more reliable than that of the medical examiner in interpreting power and efficiency in terms of motor accomplishment. Such a conclusion seems logical when one stops to consider that the teacher has the opportunity for close association and observation of the pupil while the medical examiner, as a rule, is not even acquainted with the subject.

A fourth conclusion would seem to be: That functional tests of cardiac efficiency and motor accomplishment are fairly reliable tests for measuring general power and efficiency. A correlation of .46 between cardiac efficiency and motor accomplishment is a significant and substantial correlation.

A fifth conclusion is: That too great an emphasis is being placed upon the medical examiner's rating, which is based upon a great mass of anatomical and other irrelevant measurements, and not sufficient attention is given to the value of functional tests.

A sixth conclusion apparently is: That the functional type of examination and tests is the important type for the physical educator from the educational point of view.

15 seconds until the heart returned to normal, *i.e.*, the rate before exercise.

The method of scoring the test was to take the number of seconds required for the heart to return to normal as the raw score of cardiac efficiency. The results of the test are shown in Table III. An examination of the scores shows that the time required for the 40 hearts to return to normal ranges from 30 to 120 seconds. Three returned in 30 seconds and 5 required 105 seconds to come back to normal. The raw scores are scaled by the same method used in Table I.

TABLE III

SHOWING RAW SCORES, FREQUENCY, AND SCALE SCORES OF CARDIAC EFFICIENCY

Score	Frequency	Scale Score
120	2	30
105	5	38
90	7	44
75	7	48
60	10	54
45	6	60
30	3	68

MOTOR ACCOMPLISHMENT

The Sargent Physical Test of a Man was used to test motor accomplishment. The method followed in giving and scoring the test was the same as that used by Dr. Sargent.[3] The subject to be tested stood under a hitch-and-kick disk, suspended above his head. He was instructed to bend forward, flexing the trunk, knees and ankles, and then by a powerful jump upward, straightening the legs and spine, to try to touch the suspended disk with the top of his head. He was further instructed to swing the bent arms forward and upward at the time the legs, back, and neck were extended in order to secure the maximum height in the jump. When the disk had been placed at the highest point above the head of the subject so that he could just touch it in jumping, this height was measured. The difference between this height and that of the total stature of the subject represented the height actually jumped.

Kinesiology, the science of bodily movement, furnishes sufficient evidence to substantiate the theory that motor power depends upon the strength and skill of the muscles involved. In other words, motor accomplishment is directly dependent upon the use of the right muscles, at the right time, and with the right amount of force. The physical test of a man calls for just this sort of motor effort. Surely, motor accomplishment is indicative of general power and efficiency.

Consider, first, the work done in raising the body from the deep knee bend position to standing position. It can be best expressed by the formula:

$$\frac{\text{Weight} \times \text{Half the Height}}{12} = \text{F.P.}$$

Consider, next, the amount of work done in projecting the body a certain distance into the air, above the height of the standing position. The formula for this as stated by Sargent is:

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A sixth conclusion apparently is: That the functional type of examination and tests is the important type for the physical educator from the educational point of view.

Finally, the inevitable conclusion drawn is: That the function of the physical educator in the examination should be kept distinct from the function of the physician in the health examination. In other words, the function of the physical educator is to make an examination for the purpose of determining individual capacity for an educative procedure, while the medical examiner's examination is to discover pathological conditions and defects *per se*.

RETROSPECT AND PROSPECT

These are the findings reached through this one study in this single situation. They are partial because of the relatively small number of cases, yet the principles which they illustrate are fundamental. Further studies will be necessary to show the full validity of the findings presented herein. Perhaps the greatest value this study has to offer is the challenge it issues to present methods and practices in physical education from the standpoint of economy and trustworthiness.

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THE TOWN HALL OF HEALTH*

WILLIAM A. EVANS, M.D., FELLOW A.P.H.A.
Chicago Tribune, Chicago, Ill.

I WILL LEAVE to others better informed than I the privilege of telling you of George Robert White and his will; of the purposes that he had in mind in drawing the will; of the reasons which caused the trustees to build this and other centers as a part of their interpretation of that clause in the will which reads, "of creating works of public utility not the duty of the city in the ordinary course of events to provide." I will leave to Dr. F. X. Mahoney, the experienced and capable Health Officer of Boston, or his representatives, the task of telling you the plans for this center, the agencies to be housed here, the work to be done here, and the part these plans have in the larger plans for the promotion of the health of the city as a whole.

I want to discuss a few phases of public health work which have become familiar to me by reason of a rather long participation in it—at times as an official health officer; at times as a worker in such non-official agencies as tuberculosis societies, heart societies, infant welfare societies, social hygiene societies, and a few others; at times as an official of a medical society; at times as a teacher of medical students; and at times as a publicist engaged in propaganda for health, appealing directly to the general public.

A few months ago, the British correspondent of the *Journal of the American Medical Association* wrote that the British health officers were astonished at the authority and power given voluntary health organizations in America. Their voluntary health bodies had no power that was compared to it. And yet, it is a matter of common information that, in certain fields, voluntary agencies in Great Britain have far more authority than have any non-governmental agencies in this country. There comes to mind the trade society which controls the sanitation of fishing for fish and oysters. Within its field, it has as much power as any governmental agency in the country.

The line of demarcation in Great Britain seems to be this:

A voluntary organization dealing with a trade group frequently has more power than a governmental agency in this country. A British voluntary organization dealing with the general public is not wholly without regulatory powers, but its field of influence is narrowed more than is customary in this country.

The zones of friction between voluntary health agencies and official health agencies are in evidence in this country. Utah has recently had an experience which reminds us of it. The milk problem of Kansas City is another instance. Every health officer has one or more instances in his records—some of them

* Dedicatory address delivered at the opening of the Second Health Unit, East Boston, Mass., August 4, 1926.

annoying and irritating. A center such as this one brings together under one roof the official and non-official agencies. It provides the opportunity for each group of agencies to find its field, it makes for mutual understanding. Eventually, the powers and limitations of the voluntary health agencies will come to be established and recognized. In the meanwhile, the neighborliness of a center should promote understandings and "ententes" during the formative year.

THE HEALTH CENTER AND THE PRIVATE PRACTITIONER

Permit me to single out from the reports of Dr. Mahoney and Dr. Wilinsky on the Boston centers, this statement by Dr. Wilinsky:

"We cannot emphasize too strongly the necessity for the coöperation of the physician in the district, who should be freely consulted as to the plans and policies of the health center, and who should function in the preventive program."

The most effective agent of health is the practitioner of curative medicine. He has been helpful in the past and will be in the future. He is passing through a period of great flux. Sometimes he has not found adjustment easy. There have been misunderstandings and controversies.

It lies within the powers of a center either, on the one hand, to increase friction, or, on the other, to make for misunderstanding and working at cross purposes the exceptions. A wisely administered health center will promote good feeling with the medical and nursing professions, just as it will promote understanding and good will between health departments and voluntary health agencies.

I have had some experience with health officers. I have found them honest and well-intentioned. It is very much to the credit of our profession that the administration heads of the health departments have rarely been charged even with financial dishonesty, or even the more disreputable forms of self-promotion and self-seeking. They have not always been intellectually honest, but who has been? Their record in this instance compares favorably with that of lawyers, doctors, editors and preachers. It has been my observation that these health officers have been faithful and efficient in doing well the day's work, in the sense that the day's work consisted in the obvious tasks of meeting the daily problems.

If I would criticize them adversely, it is that they are neither generals nor strategists. They are fighting disease. They have not envisaged the field, nor planned broadly, nor far, seemingly. I think they have made mistakes in that they have not called councils of strategy—and invited into them all the groups who are contributing brains. In that they have not decided on broad, far-reaching campaigns, and given each group and each person his part in the doing. A health center is in keeping with this idea.

Dr. Wilinsky says: "The fundamental principle in the creation of a practical and modern health center, is the correlation of all the health and social agencies, whether public or private, under one roof, with the beneficent results from the contact of the workers. From this must result a coördination of the activities without the duplication and waste of efforts."

May I add—it also makes possible a planned campaign. A health center working successfully in the field promotes the day when health officers will be strategists, planning their large campaigns with the counsel of coöperating agencies.

But I must not wander in this large field.

May I limit myself to four suggestions for health work, for the trial of some or all of which this center might be used as a test tube?

From the copies of the *Monthly Bulletin* of the Boston Health Department, I learn that the North Boston Unit houses such health work as goes under the names: Dental Service, Eye Service,

Medical Service of the Health Department, nurses' visits and miscellaneous unit activities. An analytical reading of the report suggests the thought that health units are eccentric in principle. They build up branch health departments close to the field of work, and thereby save transportation and the time of physicians, nurses, inspectors, and those in search of service. For this eccentric development there is claimed economy and the elimination of waste, both of which are in accordance with good business policy.

DOING TODAY'S JOB TODAY

This brings me to the first suggestion—one which is never wholly needed and yet, from the need of which we never escape. It is the importance of doing the day's work well. If you will remember, that was the subject of one of the addresses made by Dr. William Osler. If I remember correctly, Dr. Osler was speaking in this city, when he argued for living life one day at a time—forgetting the work of yesterday, and leaving tomorrow for tomorrow, concentrating the whole effort on the job of today.

I have heard Dr. W. J. Mayo give the same advice in a rather more pragmatic way. Doubtless, many of you have heard him say, or have read his expression of, the same thought. When asked how the mousetrap in the wilderness had caused men to wear a path to Rochester, he replied, in substance, and with all proper modesty: "By building a better mousetrap." He denied great vision, farsighted planning, or great organizing ability. I quote him with more detailed accuracy as follows:

"By doing the day's work the best we know how."

"By deciding each day's question each day as wisely as we can."

With the negative side of the opinions of these two great men, we may not agree. We may even say that in that negative side they did not mean what they said. Both Osler and Mayo carried the teachings of yesterday into the performance of today. Both of them looked far into the future and dreamed dreams. What they meant was that they put the job of today foremost and neither the joys nor regrets of yesterday, nor the dreams of tomorrow were allowed to crowd it from the center of the stage. The day's job of service by this health unit for this neighborhood should come first.

The second suggestion relates rather closely to the first. In fact, it may be considered a quality of the first.

INFLUENCE ON CUSTOMS AND HABITS

There is another purpose besides saving time and transportation in the plan of eccentric development of a health department. A health department located in the city hall in the central district is like the Indian's great Father in Washington. It is a long way off; it is very impersonal; it is official, machine-like, regulatory. A mayor of Chicago once abolished the health department and gave the work over to the Police Department, saying health work was nothing but police work. In the beginnings of health work, the health commissioner was known as the health officer, and most of the field men were known as sanitary police. The centralized health department finds great difficulty in escaping from the mass thought which these various citations bring to mind.

The fundamental work of a health department is to change customs and habits. The battle against specific diseases as such is incidental. A health department tries to control typhoid fever. What they are really trying to do is to modify all those customs out of which typhoid fever grows as a natural product.

If a given child has scarlet fever, it is because the habits and customs of people are such that the infective sick endanger the susceptible well. No man of a philosophic turn of mind can regard any disease, even the most specific, as other than incidental.

We read that in 1925 there were but three cases of yellow fever on the Amer-

ican continent. What does this mean? Several things. It means that so far as the great bulk of people is concerned the customs and habits have changed so that yellow fever does not fit into the scheme. But whence the three cases? That means that somewhere on the South American continent there are peoples among whom yellow fever fits so perfectly that it is trivial, unimportant and rarely attracts any attention.

We read of conquered diseases—diseases that have disappeared. And many of these statements are true. We also read of new diseases—diseases just evolving; and others that occasionally break out of their habitats and cause great pandemics. Diseases are incidents. The fundamentals are habits, customs and constitutions.

It is not easy to change habits, customs and constitutions from above. It is not easily done as a regulatory procedure, or by police power. It is best done by neighborly influence and example. Therefore, a health unit which is a branch health department should be an efficient agency. It is the old town hall in the health field, the meeting place of friends. A neighbor. If this unit can coin that thought into maxims and build their attitudes on it, they will make the day's job easier.

We are committed to the policy of democracy. If we are to escape the history of the Egyptians, Persians, Indians, Chinese, Mayans, Aztecs and Incas—either a total extinction, or else an innocuous, fireless, impotent living on—it will be because the rank and file learn the principles of life, and have the character and brains to apply it to himself, his wife, his manservant and maidservant, his ox and his ass.

Experience has shown, in the countries named, that direction from the top will not stay the working of destiny—it is either self-help or nothing. A center or unit to change habits and customs must work on the principle of self-help. That they can do better than can a centralized department.

IMPORTANCE OF THE UNIMPORTANT

My third suggestion may be regarded as a laboratory activity. It may be that Dr. Mahoney may want to try it out on this test tube. If not, I hope he will on some test tube somewhere in this great laboratory of life which men call Boston.

It is: Teaching the people the importance of the unimportant.

I know of no better way to find out what kinds of disease are regarded as important than to examine the budget of a health department and study its activities. Such study indicates that the public is interested in two groups of diseases—those having high death rates and those that are communicable. The health commissioner studies his list of deaths and their causes, and decides to spend money and effort on those diseases which come near the head of the column. He then takes up the reports of communicable diseases, and decides between them on the basis of two qualities—prevalence and communicability.

Both of these qualities leave to one side as unimportant at least two groups of very important diseases. One of these is sometimes called the minor diseases, and especially the acute infections of the nose, throat and bronchial tubes, other than diphtheria and measles; and the other those diseases of the heart, blood vessels and kidneys which are commonly designated as the degenerative diseases.

The United States Public Health Service made a study of the prevalence of sickness among 7,200 people in Hagerstown, Maryland, during a period of 28 months. This study showed that 60 per cent of all sickness was due to the acute respiratory disorders, but that these same disorders caused less than 20 per cent of the deaths.

A great many studies of disease prevalence among large groups have been reported. The majority are reports of sickness absenteeism in industrial groups. While these statistics vary greatly, dependent principally upon whether the country of absenteeism begins with part

day absenteeism, 1-day, 3-day or 8-day—they all show that common colds, coughs, and sore throats are responsible for most of the illness.

If, to these causes, we add headache, constipation, diarrhoea, and other minor digestive ills, and menstrual disorders, we get a group that causes much more than three-quarters of all the illness responsible for absenteeism. If we could add the minor illnesses which do not cause absenteeism, the minor illnesses of the same order of housewives, children and others not employed outside the home, the disproportion would be greater. And the other disorders in the group make no showing in the list of the causes of death. Neither are they communicable. Therefore, they are disregarded by health departments.

SILENT SICKNESS

The Life Extension Institute recently issued a study of degenerative diseases, calling them "silent sickness." Of these, I will speak next.

By contrast, the respiratory group and their companions in crime are loud speakers, but the health departments are not tuned in on the right wave length. They talk in terms of illness, discomfort, pain, absence from work, and secondary illnesses, but not in the terms of death, and the health department and the medical profession—all other health agencies—hear them not.

On the other hand, the degenerative diseases in this Hagerstown study caused 34.7 per cent of the deaths and only 3.2 per cent of the definitely recognized illness, the illness receiving such recognition as sickness absence from work implies. That kind of illness the Life Extension Institute called "the silent sickness." It talks, but—if I may repeat the analogy—the people are not tuned in on the right wave length to hear it. And despite the large number of deaths caused by the diseases in this group, neither are the health departments tuned in on the right wave length.

NEIGHBORLINESS—THE SPIRIT OF A HEALTH CENTER

How does this come into the young life of the East Boston Unit? If those who direct the Center will make the neighbors feel that this Center is their health town hall—their neighbors and their avatar—the minor disorders so important will find a way to a new wave length, or will teach others to tune in on the present one. The voice now cries out in the wilderness. But the ears need not hear it. Remedies or prevention can be found. And, when found, a Center can be an agency for applying them.

With respect to "the silent sicknesses," through a Center, the people can learn to tune in early on the wave lengths through which these diseases try to warn of their presence.

In this group, the factor of personal hygiene, behavior, habits, and even custom enter to an unusual degree. Here, too, comes a field in which a health unit can work to good advantage.

TEACHING THE ART OF KEEPING WELL

The fourth suggestion relates to the use of all illness for the purpose of training the sick person and his family. For a long time, intelligent consumptives have received liberal education in personal hygiene in sanitaria. After an average residence there of less than a year, they have emerged, not only convalescent, but trained in the art of keeping well.

Next, diabetes entered the list of diseases in which it is accepted that the proper medical care of the patients consists in training the patient in the art of personal hygiene. Now, heart disease is taking its place in the list.

Almost unconsciously, under the urge of an unrecognized force, the practice of medicine has been undergoing the most radical and revolutionary change which has come since the days of Galen and Hippocrates.

There are small libraries for public guidance on such subjects as consumption and diabetes. I have a series of booklets,

intended as pathfinders and trail blazers, which I call the "How to Live With Series." They tell people how to live in some comfort and efficiency with abnormal blood pressure, Bright's disease, epilepsy, after apoplexy, in spite of menstrual disorders, and one volume is devoted to the care of the cured consumptive. The series does not include diabetes and infant care, because these subjects are already covered by good books readily available. There will be other titles in this series.

Presently, the whole field will be covered by those who write of their experiences in the field of disease.

The thought that I have is that every illness sufficiently serious or disabling to send a person to a hospital, or to keep him in bed, or away from work for a fair period, should be made of some use to teach the patient personal hygiene. The patient should go back to work knowing how to live with his chronic disease, how to prevent it from advancing, how to protect himself against breakdowns, how to eat, how to exercise, and so on, through the curriculum.

Every person in many large groups, including the consumption group, the diabetic group, and the heart disease group, should earn for himself the degree of bachelor of the art of living. Every prolonged illness should offer an opportunity for this course of training and every physician, hospital, and dispensary should consider such training as a part of the care of the sick.

THE STUDENT HEALTH PROGRAM EXCLUSIVE OF CLASSROOM INSTRUCTION*

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PLANNED CAMPAIGNING for health is a comparatively new activity in university life. Students have clambered into these institutions or have been pushed into them by eager parents—have sat in the classroom, have absorbed some information, and have rushed forth to conquer. If we accept Spencer's definition that "True education is training for complete living," we must admit that the universities have failed to educate. Unless the body be sound and trained to function efficiently, unless the mind be properly informed as regards modern health knowledge, and unless both mind and body be habituated to the regular practice of healthful habits, there can be no "complete living."

The student health program may be separated into 4 main divisions: (1) instruction in and practice of the laws of health; (2) such an organization of the university and its curriculum and such a division of students' time as will present opportunity and create desire for a sufficient amount of the right kind of physical activity and recreation each day under good sanitary conditions; (3) a health service which will guard and guide the physical, mental, and moral welfare of the whole college community; (4) a definite and specific training in the content and methods of teaching healthful living for those of the student body who expect to become teachers.

In this paper the second and third divisions will be discussed. The second is usually spoken of as physical education, and the third, it seems advisable to name

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"health service" with a heavy accent on the *service*.

PHYSICAL EDUCATION

Physical education has been the halting and laggard child of the program of studies, and in most universities it still is. There have been several reasons for this. We find a very peculiar situation where directly antagonistic elements among those in control of the destiny of the institution, are joining hands, unconsciously but nevertheless effectively, in order to smother this struggling but rapidly growing infant. At one extreme is that large, influential, and vociferous portion of the alumni whose main interest in their alma mater is to have it produce winning athletic teams. They fear that a properly organized physical education program, reaching all the student body, will loosen their grip on the varsity athletic teams. At the other extreme, stand the pedants on the faculty who, when they think at all of the body of a student, image it merely as a machine for bringing the mind into the classroom. This group fears any interest or activity that may take time or energy from their own beloved subject.

Other reasons for the backwardness of the physical education program rest in the expense involved, both in securing adequate management and instruction for it, and in acquiring sufficient land and providing adequate buildings and equipment so that it may be operated efficiently.

These difficulties of securing instructors, land, and buildings are being rapidly overcome; by taxation in the case of the state universities, and by gift in other cases. Legislatures and the saner of the graduates have become convinced that these facilities are essential before any university may legitimately claim the title, "great."

While much progress has been made in overcoming the objections of the more retarded faculty members, so that now, in a considerable proportion of the universities, time is set aside for this essential subject, much of the battle still remains to be won. Frequently, students are required to do the work but no credit is given for it. More frequently, the steadily weakening grip of the classicist is still powerful enough to prevent the teachers in this subject from receiving proper recognition—faculty rank. As a result, their institutions can neither attract nor retain the better trained, more able instructors in this field of education. Self-defense will drive university corporations into overruling these faculties.

The power of the alumni is still a serious factor. In many of our colleges, intercollegiate athletics is the only form of physical education; the tail wags the dog. Varsity teams monopolize the gymnasium and play fields, while the rest of the students (whose underdeveloped bodies, if they are to live completely, need physical activity much more than do those of the physically powerful athletes) sit or stand on the side lines and have hysteria. While the evils of intercollegiate athletics are many, they also present many opportunities for good, if properly controlled and supervised.[1]

The great need then is to swing over from the policy of "all for athletics" to that of "athletics for all." To accomplish this, certain fundamentals are necessary.

TWO HOURS DAILY FOR EXERCISE

Time is an essential element in a proper program. The present situation varies all the way from those collegiate institutions where no time is set aside for body building, to the excellent plan adopted in the best of our private preparatory schools where two hours daily on the playground or in the gymnasium is a fixed requirement. To secure this time, a rearrangement of the daily schedule of classroom and laboratory work is necessary. Where students are held in class or in laboratory until 5 o'clock, no effective health building program can function. To declare

that this is not possible, is to admit that either the desire for it, or adequate laboratory and other facilities are lacking.

Where physical education activities are an established requirement, the most common time allotment is two clock hours weekly, usually on two different days. The ideal would be the two hours daily used in the best of the preparatory schools. A fair compromise—and any growing factor in education must compromise, at least temporarily—would be two hours at a time on two days each week. This gives time for change of clothing, adequate physical activity, and bathing at each period.

PLAY SPACE AND FACILITIES NEEDED

Space must be provided in such amounts that there may be ample room, not only for large numbers to work at one time, but for the playing of the organized team games, such as football, soccer, lacrosse, and baseball. Baseball, for instance, has a space requirement of at least four acres. These spaces should be in addition to those fields set aside for varsity sports. For the university having more than 2,000 students, 100 acres is scarcely adequate. These fields should be leveled, graded, sub-soil drained, seeded, and equipped for play.

Buildings must be provided—not only a gymnasium, but locker and bathing facilities—adjacent to the play fields. The gymnasium of our fathers and grandfathers, having a single large floor space, is totally inadequate. Our present concept demands a large gymnasium, so designed that the floor space may be divided at times into several play courts each 50′ x 80′ in size. Adjacent to this building, or within it, should be a modern sanitary swimming pool. Adjacent or near by should be also a large field house or "cage" with an enclosed area approximately 200 feet square, free from posts, with the girders at least 40 feet above the floor, and this floor should be made of dirt. Here team games may be played throughout the year.

TRAINING FOR FUTURE RECREATION

Presumably, one goes to college to be trained for life. In the great majority of cases team games are little used or usable after the age of thirty. Our program then needs the addition of games that can be so used. This means provision for handball, tennis, squash, and other games that may be used for the play of twos or fours, having fairly unchanging rules, and not requiring grilling drill in team play. Golf also should be provided for, including facilities for indoor practice. These definitely train for proper use of leisure time, when college days are past.

A teaching force, training in the basic anatomical and physiological needs of the body and in the technic of the many different phases of physical education, is an imperative factor. The best thought in this field of education is of the opinion that there should be at least one instructor for every 100 students regularly using the facilities.

CREDIT FOR THIS WORK

A fourth requirement, and an extremely important one, is that credit should be given the student for this work, on the same ratio of credit to the time used as is done for other laboratory courses. An essential corollary is, that if the student fails to do satisfactory work, he should be made to repeat the course until he does. If it is apparent that he *will* not, he should be dropped from college as for any other serious failure. Already some colleges refuse a degree to the student who has failed to learn to swim, and at least one drops him at the end of the sophomore year for such failure.

In the major portion of our universities, intercollegiate athletics is practically the only form of physical activity, and a well developed intramural program has yet to be instituted and worked out. In other words, the part is considered greater than the whole. Where there is a program, frequently it is made com-

pulsory for freshmen only. Rarely indeed does it include all the students, although a few universities have been far-visioned enough and have space and funds enough to do this.

An intramural program, made compulsory for all, and broad enough in its scope to create in all a desire for physical skills, should be the base of the plan. This should include some formal gymnastics and a wide range of games, sports, and competitive endeavor. Upon this may then be built intercollegiate athletic competition. This competition will be better and more successful because of the huge background of an efficiently trained mass of students from which to draw varsity material.

Within reasonable limits, students should be permitted to select the type of activity they prefer. There should be sufficient guidance and control, however, so that a student shall not get into a game or sport too strenuous for his physique or for his vital organs. The program chosen should fit his mental and physical needs; varsity athletics should be the capstone, not the foundation. Certain skills and powers should be acquired before a student is allowed to participate in certain sports or to compete on any varsity team. For instance, no man should be allowed to row unless he can swim.

ORGANIZE GROUPS BY SKILL

Groups and classes should be organized in accordance with the skill and strength of the individual. From the most proficient group, squad leaders should be picked. To the least proficient group, special instruction, designed to correct posture or to build up weakened parts of the body, should be given. The greater part of the students—probably 80 per cent—will fall in neither of these classifications. To this 80 per cent, the general program should be adapted.

Rank, for credit and promotion, should be based on physical ability—that is, on the ability to accomplish certain standard tests in the field of gymnastics, athletic games, swimming, and the like.

Under such guidance and organization, all will acquire certain physical skills which will make them more efficient citizens, living more completely, not only during student days, but throughout the allotted span of life; and the span itself will be lengthened.

HEALTH SERVICE

The health service should be a real service for the prevention of disease, care of the acutely sick and emergencies, such as accidents; for the correction of physical defects; for upbuilding, through advice on health habits and guidance and control of diet; and for inspection, control, and improvement of sanitary conditions of all buildings in which students work, eat, play, or live. At those institutions where the majority of students live in college dormitories, this last phase of health is much more easily controlled than it is when students live in fraternity houses, or when—as in most city colleges—all or most of them live in private homes.

We must know the physical condition of the students upon entrance and throughout their attendance. This knowledge helps us to advise as to the scholastic load, to explain, sometimes, causes of failure in the class room, to give guidance at times of impending nervous breakdown and in other phases of mental hygiene, and, to a large extent, to check the spread of communicable disease.

It finds those who have organic weakness, and makes possible special class assignments for these in physical education work, and helps to keep them off teams, varsity or intramural, where the strain is so great as to be dangerous to them.

Upon entrance, and at least once each semester, each student should be given a careful and complete physical examination, covering nutrition, the special senses, the physical condition and functioning of all organs, and the presence or absence

of communicable disease, both acute and chronic. This means also a careful investigation of the habits of the individual, both mental and physical.

NEED OF FREQUENT REËXAMINATION

The importance of frequent reëxaminations cannot be overemphasized. In one college, the examination last October showed a negative condition of the lungs of a certain freshman. Yet in April, while in the chemical laboratory, he had a serious pulmonary hemorrhage. An examination in February should have disclosed the diseased lung condition, and immediate cessation of work plus complete rest in bed might well have prevented this very weakening hemorrhage. Here is another case. The record of a junior who had five successive examinations in two and one-half years showed a negative urine. Yet the sixth examination, given this spring, showed a urine loaded with sugar, although no signs or symptoms of diabetes had been observed by the student or by his family. Because of the discovery, he stands a much better chance of surviving than if the trouble had not been found until symptoms compelled a urine examination.

ENFORCE CORRECTION OF DEFECTS

Finding defects is of little value unless something is done to correct them. If the defects be muscular or postural, the physical education program can improve the condition. If they be of the special senses or of vital organs, immediate attention is essential, preferably by the family physician or dentist. The university should insist that correctable or improvable defects be taken care of at once. If the student persistently neglects or refuses to follow medical advice he should be dismissed from the institution. So long as college education costs annually several times as much as the student pays in tuition, the college has the moral, as well as the legal right to dismiss those who refuse to put themselves in the best possible physical condition, so that they may profit fully by the instruction given. Conversely, no student should be dropped whose scholastic failure is traceable to a correctable physical defect until the student has had a chance to secure correction.

Absences have a definite relation to the health conditions of both students and college. All absences should be traced to their cause. If due to illness, the student should report to the college medical advisor before reporting for class work. This has several advantages. The student is prevented from resuming work before adequate strength has returned; he is prevented from bringing contagion into the classroom; and if the illness is due to a chronic condition, a special examination is likely to find the cause, and is a means of bringing the student back to normal. Annually, at least, the causes of absence should be tabulated and studied. Such studies are likely to lead to discoveries that will check certain illnesses, cut down absences, and guard the health of all students.

At those universities where the students reside in dormitories, clinics should be established for several purposes: To diagnose and isolate cases of acute communicable disease; to diagnose and place under immediate treatment other acute illnesses; and to diagnose and care for chronic physical defects which have manifested themselves since the regular semi-annual examination. Such clinics guard the university from epidemics, reduce the number of days of absence because of acute illnesses, and reduce the amount of scholastic inefficiency due to chronic defects or illnesses, which, while not marked enough perhaps to cause the student to stay away from classes, are severe enough to slow up the rate of scholastic progress.

HOSPITALIZATION AND SANITATION

Adequate quarters and expert medical service should be provided, not only for these clinics but also for the hospitalization of the more severely ill. If the university is at all isolated, or in a small

community, the need of adequate hospital facilities is imperative.

Proper inspection and care of the sanitary conditions are most important.

Knowledge of sanitation should be made use of in building construction. Sanitary equipment should be modern and must be kept in cleanly condition. In isolated regions, sanitary methods of sewage disposal must be provided. Water and food supplies must be safe.

Inspection of toilets, baths, etc., should be made daily, and all errors or defects corrected. Cleanliness should be obtained by hot water, soap and labor—not merely aimed at by the use of the very ineffective but loud smelling deodorants and so-called disinfectants. In other words, if filth is present it should be removed, not merely masked by some chemical that smells worse.

The living conditions in dormitories must be carefully investigated repeatedly. Such investigation, as a public health measure, must include college dormitories, fraternity houses, and private homes accommodating students. A careful record should be made of the possibilities for sunshine and fresh air in sleeping rooms. Students should be instructed as to the need of frequently fresh bedding, towels, etc.

Eating places are a peculiarly fruitful source of illness. Not only must we control their sanitation, preparation of food, washing of dishes, cleanliness of attendants, table linen, etc., but also the methods of cooking, the content of menus, and the proportions of the vitamines, coarse fibrous foods, and fruits.

Such a program calls for an adequate staff, not only of instructors in physical education, but also of doctors trained in medicine and public health, of nurses, dietitians, and psychologists. At least one psychiatrist should be employed, on the basis of a consultant, as advisor in problems in mental hygiene. All other employes, including coaches of varsity athletics, should be on a full time basis, and should hold faculty rank, prestige, and responsibility, so that their directions may have all possible force and influence.

This sounds like an expensive program. It is. It should be remembered, however, that many institutions already have most of this personnel in various positions. Effectiveness will be much increased by better correlation and coöperation. All the physical education, teaching of hygiene, health service, and the training of teachers in these fields should be united in one department functioning under a chief of full professorial rank—preferably a physician.

Such a department, so officered, is competent to do, and should be engaged in, specific research in the field of student health.

The universities owe it to themselves and to their students to function more efficiently in building health and physical proficiency, both in their present student body, and—through their graduates—in the myriads of children in our public schools. Then only may the universities honestly claim to be truly educating for complete living.

REFERENCE

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DETERMINING THE VIRULENCE OF POSITIVE DIPHTHERIA CULTURES

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SINCE THE discovery and extended use of the Schick test for susceptibility to diphtheria and the use of the toxin-antitoxin mixture for prophylactic immunization, consideration of the virulence of the diphtheria organisms isolated from the patient seems to have been neglected. The latter question is very important from the point of view of the Board of Health that is holding a carrier under observation or restraining a child from attending school. It is also important from the viewpoint of a contagious disease hospital waiting to discharge a convalescent diphtheria patient. In both instances, it is essential to know whether the diphtheria organisms cultured from the patient are capable of producing the disease in another person if transmitted.

Tests for virulence may be divided into the following groups: (1) those involving special staining reactions, as discussed by Neisser,[1] and Westbrook, Wilson and McDaniel[2] (now universally disproved); (2) those calling for animal inoculation with pure cultures with the subsequent death of the animal, as recommended by Loeffler[3]; (3) those using intracutaneous inoculations of small amounts of a pure culture, determining the result by the character of the skin reaction, as described by Romer,[4] Neisser,[5] Zingher and Soletsky[6]; and (4) those using "field" cultures, either to kill the animal, as suggested by Wayson,[7] or in smaller amounts to give a skin reaction as described by Force and Beattie[8] and Havens and Powell.[9]

Disadvantages may be demonstrated in each of the above methods. In any method involving the use of pure cultures, the primary difficulty is that of isolation, as shown by Okell and Baxter,[10] Zinsser,[11] Eagleton and Baxter[12] and others. Furthermore, while the percentage of avirulent colonies that might be fished from a positive culture is low, yet the possibility is not to be overlooked.

ISOLATION AND TIME ELEMENT

In clinical diagnosis the time element makes a test involving isolation one to be avoided. If all the steps are accurately carried out, 4 to 9 days are necessary, even if one allows no time for replating or a second isolation.

In the intracutaneous test with "field" cultures the disadvantage of isolation is eliminated, and the time required is greatly decreased, but at the same time the difficulty of reading results is correspondingly increased, through masking of the true reaction by the presence of pyogenic infection.

Since it is universally accepted that virulent organisms cannot be distinguished from avirulent by morphological or cultural methods, the differentiation must necessarily be based on toxin production. The only method that is at present recognized for determining the presence of this toxin is by animal inoculation, a virulent culture giving a typical picture on autopsy of the animal or a typical skin reaction. Comparison is always made with a control animal previously immunized with diphtheria antitoxin. It is also generally accepted that the susceptibility of guinea pigs to diphtheria toxin is approximately the same as that of man, although probably in a

slightly less degree.[13] Hence, the pathogenicity of a suspected culture of organisms for guinea pigs has been accepted as an index of its pathogenicity for man.

The satisfactory virulence test should combine, in simple technic, the best points of the tests indicated above, but should at the same time be free from their faults. In other words, a test making possible the use of a "field" culture, without first isolating the suspected organisms, would be worth trying, provided the effect of the contaminating organisms on the experimental animal could be sufficiently reduced. Such a test has been developed, and is here described, together with its results.

METHOD OF PERFORMING THE TEST

Inasmuch as it is the diphtheria toxin which is the cause of the characteristic positive reactions in the injected animals, whether the injections are made subcutaneously or intradermally, it seemed that the most logical and pertinent method of attack might be summarized in the expression, *cherchez la toxine*. With this end in view, a method was chosen and modified with the purpose of furnishing the diphtheria organisms present the most favorable environment for toxin production, as far as this could be accomplished in the presence of the usual throat and nose flora. By employing for injection the Mandler filtrate from broth cultures, the disturbing effect of the contaminating organisms was greatly reduced. Any reaction which resulted would be largely or entirely determined by the amount of diphtheria toxin present in the filtrate, and the control furnished by the immunized animal would serve as a check for the specificity of the reaction.

PREPARATION OF THE FILTRATE

The selection of a medium that will furnish the optimum conditions of growth is of paramount importance. Three factors are essential: (1) Beef infusion must be the base; (2) the pH must be 7.8; (3) a suitable grade of peptone must be used. The last factor is especially important, for it is necessary to use a peptone that has a high buffering value to offset the acid production of the diphtheria bacilli, as well as of the associated organisms. Wilcox[14] found that Witte's peptone had an inhibitory or destructive influence on the toxigenic power of Park No. 8, and recommended the use of Parke-Davis peptone. Bronfenbrenner[15] has made an extensive study of the buffering values of different peptones in connection with their use for fermentation. "Since diphtheria toxin is produced best at pH 7.8," he states, "it will be necessary to use as a buffer a peptone whose pH lies in this range. Both Witte and Difco are naturally in this range, but either Aminoid or Armour's when properly adjusted with NaOH has a better buffering power between pH 7.0 and pH 8.0 than the two former."[16] In this study Armour's peptone (2 per cent) was used. By using 10 c.c. of this medium in a 150 c.c. Erlenmeyer flask inoculated with a loopful of culture, enough toxin is produced in 24 hours' incubation to give a specific reaction in from 1 to 4 days on intracutaneous injection into a guinea pig.

The details of the preparation of the filtrate are as follows: A loopful of organisms from a morphologically positive culture is inoculated into one of the broth flasks described above, and incubated for 24 hours at 37° C. The time element is of utmost importance because of acid production by contaminating organisms, as well as by the diphtheria bacilli, which will practically detoxicate the culture on the second day. The culture is then filtered through a tested Mandler filter, and the filtrate is used in the reaction.

Two guinea pigs are prepared for the test by shaving the entire abdomen. One of these, to serve as a control, is injected intracardially with about 300 units of antitoxin a few minutes before receiving the filtrate inoculation. Four cultures may be tested on each animal used, the injection being made at intervals of about

3 cm. and consisting of 0.2 c.c. of the Mandler filtrate, given intradermally.

Results are read at 24-hour intervals for 4 successive readings and interpreted as follows in degree of positivity:

0 No reaction
+ Reddening around point of inoculation at least 6 mm. in diameter, with no induration
++ Marked induration of the skin around the point of inoculation with redness
+++ Increasing induration and redness with beginning of crust formation
++++ Crust formation with cracking of indurated area

EXPERIMENT I

That a comparison might be made between the number of living organisms and the amount of toxin produced by these organisms necessary to give a reaction when injected intradermally, the following experiment was undertaken. A subculture of Park No. 8 strain of diphtheria was kindly furnished by Dr. Benjamin White of the Massachusetts Vaccine Laboratory. A fresh 18-hour broth culture of diphtheria bacilli was counted and 0.2 c.c. of varying dilutions (giving correspondingly varying bacterial counts) was injected intradermally into each of two pigs, one normal, the other protected with antitoxin. The results of the experiment showed that 100,000 live organisms were needed to give a good positive reaction.

A control experiment substituting Staphylococcus aureus for the diphtheria bacillus showed a definite pustule formation after injecting 1,000,000 organisms, with no induration, and no crusting.

EXPERIMENT II

A second experiment was made to determine the number of diphtheria organisms necessary to produce enough toxin, when grown in Armour's peptone broth for 24 hours, to give a skin reaction when injected intradermally. The different culture dilutions were made by inoculating counted diphtheria bacilli into flasks containing 10 c.c. of broth, and incubating these subcultures for 24 hours at 37° C. After 24 hours each culture was filtered through a Mandler filter and 0.2 c.c. of each filtrate was inoculated intradermally into each of two pigs, one normal, the other protected by antitoxin. The results are given in Table I.

CONCLUSIONS OF EXPERIMENTS I AND II

From this experiment it was discovered that 10 diphtheria bacilli are sufficient to produce enough toxin in 24 hours, so that 0.2 c.c. of the filtrate will give a positive skin test. This finding compares favorably with the results shown in Experiment I where 100,000 live organisms were necessary to give a positive skin reaction, when inoculated directly into the skin.

A similar test using the filtrate of a 24-hour growth of Staphylococcus aureus gave no reaction.

From these 2 experiments it may be concluded that filtrates will give a positive skin reaction if diphtheria toxin be present and that the Staphylococcus aureus (a common contaminating organism) does not produce any substance, toxin or otherwise, that will stimulate the reaction produced by diphtheria toxin.

TABLE I

Number of Live Diphtheria Organisms Necessary to Produce Enough Toxin to Give a Skin Reaction

Number of Organisms		Results		
		1st day	2d day	3d day
100,000	Normal pig	+	++	++++
	Immune pig	0	0	0
10,000	Normal pig	+	++	++++
	Immune pig	0	0	0
1,000	Normal pig	+	++	++++
	Immune pig	0	0	0
100	Normal pig	+	+	++++
	Immune pig	0	0	0
10	Normal pig	+	+	++++
	Immune pig	0	0	0
1	Normal pig	0	0	0
	Immune pig	0	0	0

EXPERIMENT III

To determine the ability of diphtheria organisms to grow and produce toxin in the presence of contaminating organisms, pure cultures, of diphtheria of known virulence, were inoculated into 10 c.c. of broth, with an approximately equal amount of organisms from a negative throat culture. These mixed cultures were incubated as before for 24 hours, filtered, and 0.2 c.c. of the filtrate injected intradermally into a guinea pig. No differences were noted from the presence of contaminating organisms in normal or immunized animals.

EXPERIMENT IV

A fourth experiment was made to determine the amount of toxin, expressed in M.L.D., necessary to give a skin reaction when injected intradermally. For this text, toxin was kindly furnished by Dr. White, having a M.L.D. dose of 0.003 c.c. Expressed in another way, 0.2 c.c. of a 1:70 dilution of the toxin would contain approximately 1 M.L.D. In the experiment 0.2 c.c. of varying dilutions of the diphtheria toxin were inoculated intradermally. The results are shown in Table II.

This table shows that approximately $\frac{\text{M.L.D.}}{12}$ will give a positive skin test, indicating the sensitivity of the test.

EXPERIMENT V

In attempting to determine whether a greater or less amount of toxin would be obtained by lengthening the incubation period, 5 cultures were taken from clinically sick cases of diphtheria and incubated for 3 or 4 days. The filtrates from these cultures gave negative or weakly positive results upon animal inoculation. The explanation of these results probably lies in the production of acid by contaminating organisms, which not only inhibits toxin production but also destroys toxin already produced during the first 24 hours. However, it must be noted here that no prior or subsequent virulence tests were carried out with any of these cultures in the usual manner, but in view of the fact that the cases were clinically sick with diphtheria, it seems only reasonable to asume that the cultures were virulent.

APPLICATION OF THE TEST

Tests were made on cultures from patients harboring diphtheria bacilli. The patients were divided into 3 groups, viz.: those with clinical diphtheria, convalescent carriers, and healthy carriers. This distinction is of necessity an empirical one for there is no sharp dividing line between the groups. The first group comprised all those cases actually sick with diphtheria, whether faucial, nasal, laryngeal or wound. The criteria for making the diagnosis are those of the clinical picture of diphtheria. Such cases usually get well and are discharged with negative cultures in 21 days. If, however, their cultures persist positive longer than this period, without clinical symptoms, they then may be considered as convalescent carriers. The organisms may or may not be virulent. Healthy carriers are contacts who harbor diphtheria bacilli, yet have never had the disease. They are themselves immune, but the organisms may or may not be virulent. In all instances the Mandler filtrate was injected intradermally (as described above), and in selected cases where isolation of pure culture was possible a control test was made, making subcutaneous inoculations. All tests were controlled by similar injections into immune pigs and all these tests were negative.

In all, 81 cases were tested. An analysis of the results found, shows that all cultures giving a positive virulence test by the subcutaneous test also gave a positive test by the intradermal method, using the Mandler filtrate from positive "field" cultures. Three cultures that gave negative tests by the subcutaneous route gave positive intradermal tests. (Of these, 2 were clinical diphtheria cases and 1 was a healthy carrier.) Six cultures that

TABLE II

Amount of Diphtheria Toxin Necessary to Give a Skin Reaction

0.2 c.c. of Dilution of Toxin		Results 1st day	2d day	3d day
*1:80	Normal pig	+	dead	
	Immune pig	0	0	0
*1:160	Normal pig	+	dead	
	Immune pig	0	0	0
1:200	Normal pig	±	++++	++++
	Immune pig	0	0	0
1:400	Normal pig	±	++++	++++
	Immune pig	0	0	0
1:800	Normal pig	±	++++	++++
	Immune pig	0	0	0
1:1600	Normal pig	±	++	+++
	Immune pig	0	0	0
1:3200	Normal pig	±	±	+
	Immune pig	0	0	0
1:6400	Normal pig	±	±	0
	Immune pig	0	0	0

* Several injections on one pig.

could not be isolated in pure culture gave a positive intradermal test. (One of these was a convalescent carrier and 5 were healthy carriers.) Of 45 cultures giving negative tests by the "filtrate" method, 26 gave a negative test by the pure culture method, 6 could not be isolated and 13 were not done.

It is recognized that the data obtained is incomplete, in that all of the 81 cultures were not controlled by the pure culture method. However, the results obtained seem to warrant a preliminary report. Further study is now being done, checking especially the cases carrying organisms that are virulent.

SUMMARY

A virulence test has been developed which is comparatively free from the objections applicable to some of the tests in general use. Its advantages are:

1. The final report is ready in from 2 to 5 days after the receipt of the field culture. This economy of time is due to the fact that,

(a) It is not necessary to first isolate the suspected bacteria from contaminating organisms.

(b) The animals react more rapidly without loss of specificity of reaction.

2. Economy in the use of animals. Four or even 6 tests can be carried out simultaneously on 1 normal and 1 immune guinea pig. As a rule the animals survive, and can be used later for other purposes.

3. The probability of obtaining false negatives is less than in methods requiring pure cultures, since the possibility of losing virulent organisms during the process of isolation is obviated.

It is superior to tests involving the subcutaneous or intradermal injection of mixed cultures in that, by filtering the 24-hour broth culture, the effect of the contaminating organisms is made negligible. The test is based solely on the ability of the organisms to produce diphtheria toxin, and errors due to pyogenic infection are avoided.

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MERCUROCHROME VERSUS GENTIAN VIOLET

PART I. IN VITRO EXPERIMENTS

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A GREAT DEAL is being written at the present time about the therapeutic use of mercurochrome and gentian violet and a survey of the literature indicates a more or less brilliant future for both. Despite this large volume of literature, little work seems to have been done on mercurochrome in vitro. The present paper presents data from such experiments, with a comparison of the "in vitro" effect of the two dyes.

The amphoteric behavior of bacteria makes it necessary, in comparing the effectiveness of two bactericides or bacteriostats, to simulate as far as possible the principal factors of therapeutic environment in the in vitro experiments.

That bacteria do behave as ampholytes has been demonstrated in various ways. If *B. coli* are cultured [1] in media containing a basic dye but no sugar, as growth proceeds the pH increases to a range 7.6 to 8.4 and the bacterial sediment will be deeply stained with the dye. If acid dye is used in a similar medium the bacterial sediment is only slightly stained. If to the media sugar is added, then as growth proceeds the pH decreases and finally reaches a range 4.3 to 5. Under these conditions it is the acid dye which stains the sediment, the basic dye having little if any effect.

Staining reactions have also demonstrated the amphoteric character of bacteria. Smears fixed to slides[2] were stained in one case with acid fuchsin and in the other with basic gentian violet. Each smear was then buffered at varying values of pH and finally decolorized with acetone. At high pH values all organisms retained the basic dye. As the pH was lowered a point was reached, characteristic of the organism, where retention was diminished, and finally at sufficiently low pH all organisms were completely decolorized. The opposite is true of acid fuchsin. All organisms retain this stain at sufficiently low pH. As the latter is raised they at first partly, and at sufficiently high values, completely lose the stain. Table I, taken from graphs showing the so-called isoelectric range of various organisms, gives briefly the results of such experiments. Under A is given the limiting pH of maximum apparent retention of dye and under B the limiting pH of decolorization.

Winslow, Falk and Caulfield [3] showed that *B. cereus* in a water suspension migrated toward the anode at pH values above 3, their rate of migration rising to a maximum at a pH of about 10 and then falling, in general accordance with the Donnan equilibrium curve. At about 3 an isoelectric point was observed. At lower pH values the organism migrated in the opposite direction, the rate again passing through a maximum.

EXPERIMENTAL

Conditions for Maximum Effectiveness—Cultures of the organisms listed in Table II were inoculated into lactose broth tubes buffered with phosphate mixtures and containing varying amounts of dye. After 96 hours incubation at 37 degrees the tubes were examined for growth, and a loopful from each tube was streaked on a plain agar slant. The slants were incubated for 48 hours after

TABLE I

Gram Classification	Organism	Gentian violet A	Gentian violet B	Acid fuchsin A	Acid fuchsin B
Distinctly positive	B. cereus	4	<1	1	5
Positive variable	B. diphtheriae	6	2	2	5.5
Negative variable	B. dysenteriae (S)	5.5	<1	2	5.5
Distinctly negative	B. coli	8	4	3	7

Showing the Chemical Differentiation of various classes of organisms as evidenced by staining reaction.

which smears were made, stained and examined microscopically, thus checking up on any possible contaminating organism. The results in the table can be taken either as those of the 96-hour broth incubation or the checks, since they were in all cases parallel.

At the pH of human blood gentian violet is considerably more effective than even at the neutral point and many times more so than in slightly acid solution. The higher the alkalinity of the growth medium the more bacteriostatic the dye is. The opposite is true of mercurochrome. It is the disodium salt of dibromo-oxymercuri-fluorescein, and thus its dye basis is an acid dye. Acid dyes have been noted as inferior bacteriostatic agents, but only so because their effective pH is so low that very few organisms will grow at such a value.

Direct Comparison at Blood Reaction—The procedure above outlined gave the results shown in Table III. The pH was adjusted to 7.4 by phosphate mixture. When no growth was apparent a loopful of the liquids streaked on agar confirmed the observation by showing no growth.

Cumulative or Time Effect—A definite amount of bacterial suspension was transferred to each tube of two series of tubes containing varying amounts of either gentian violet or mercurochrome. For each dye concentration there were two tubes. One tube, A, was left at its initial pH and the other, B, was made slightly alkaline before sterilization. After inoculation with the organism to be studied the tubes were placed in the incubator at 37 degrees C. After the intervals given in Table IV, a standard loopful was transferred from the first tube, A, to broth adjusted to a pH of 5.6, and a loopful from tube B was transferred to media adjusted to a pH of 7.7. The results of 72-hour incubation are given in the table.

TABLE II

Dilution	Mercurochrome pH 5.28	Mercurochrome pH 6.23	Mercurochrome pH 7.73	Dilution	Gentian Violet pH 5.28	Gentian Violet pH 6.23	Gentian Violet pH 7.73
			Bacterium coli—strongly Gram negative				
1,000	—	—	—	10,000	—	—	—
2,500	—	—	+	20,000	+	—	—
5,000	—	+	+	30,000	+	+	—
10,000	+	+	+	100,000	+	+	—
			Bacillus dysenteriae (Shiga)—weakly Gram negative (variable)				
	5.28	6.23	7.73		5.28	6.23	7.73
5,000	—	—	—	150,000	—	—	—
10,000	—	—	+	200,000	+	+	—
20,000	—	+	+	300,000	+	+	—
40,000	—	+	+	500,000	+	+	+
			Corynebacterium diphtheriae—weakly Gram positive (variable)				
	6.0	6.9	7.73		6.0	6.9	7.73
10,000	—	—	+	250,000	+	—	—
20,000	—	—	+	500,000	+	+	—
40,000	—	+	+	1,000,000	+	+	+
80,000	+	+	+	2,000,000	+	+	+
			Staphylococcus pyogenes aureus—strongly Gram positive				
	5.28	6.23	7.73		5.28	6.23	7.73
10,000	—	—	+	1,000,000	—	—	—
20,000	—	+	+	2,000,000	+	—	—
40,000	+	+	+	4,000,000	+	+	—
80,000	+	+	+	6,000,000	+	+	+

Showing the reverse pH effect on the bacteriostatic action of gentian violet and mercurochrome.

TABLE III

Organism	Gram Character	Inhibiting Dilution at pH 7.4		
		Gentian Violet	Mercurochrome	Ratio
B. coli	Distinctly negative	50,000	1,500	33
B. dysenteriae (S)	Negative variable	200,000	5,000	40
B. diphtheriae	Positive variable	400,000	5,000	80
Staph. pyogenes aureus	Distinctly positive	1,000,000	5,000	200

Showing the variation of bacteriostatic effect of gentian violet and mercurochrome with variation in time of exposure.

The results from tubes A are headed "acid," and those from B are headed "alk."

Comparing these results with those of Table II will show the necessity of repeated injections of either agent if its effect is to be lasting. As will be seen, where the bacteriostat is incorporated in the broth so that the organism is unable to throw off or digest it without immediately encountering more material to take its place, the inhibiting dilution is much higher. In such an experiment it is the cumulative effect rather than the immediate one which is acting and a correspondingly high inhibiting dilution is in such an experiment listed. This is not true in experiments such as those listed directly above and inhibiting dilutions are correspondingly smaller.

DISCUSSION

The results of the above experiments tend in general to indicate the superiority of gentian violet over mercurochrome, in vitro. The former has its maximum effect at blood reaction, while the latter is much less effective there than under more acid conditions. The former is bacteriostatic at much higher dilutions for all types of organisms studied, ranging from a ratio of about 200 times for the strongly Gram positive Staphylococcus to about 30 times for the strongly negative

TABLE IV

Summary of Experiments.

Gentian Violet			Mercurochrome		
Time of Treatment with Dye	Acid	Alk.	Time of Treatment with Dye	Acid	Alk.
Bacterium coli					
Dilution 1–1,500			Dilution 1–250		
10 min.	—	—	10 min.	+	+
30 min.	—	—	30 min.	—	+
1 hr.	—	—	1 hr.	—	—
			24 hr.	—	—
Dilution 1–2,500			Dilution 1–500		
10 min.	+	+	10 min.	+	+
30 min.	+	—	30 min.	—	+
2 hr.	+	—	1 hr.	—	+
48 hr.	—	—	24 hr.	—	—
Dilution 1–5,000			Dilution 1–1,000		
10 min.	+	+	30 min.	+	+
30 min.	+	+	1 hr.	+	+
1 hr.	+	+	24 hr.	+	+
24 hr.	—	—	48 hr.	+	+
			96 hr.	—	+
Staphylococcus pyogenes aureus					
Dilution 1–500,000			Dilution 1–250		
10 min.	—	—	10 min.	—	+
30 min.	—	—	30 min.	—	—
1 hr.	—	—	1 hr.	—	—
Dilution 1–750,000			Dilution 1–500		
10 min.	+	+	10 min.	+	+
30 min.	+	+	30 min.	—	+
1 hr.	+	—	1 hr.	—	—
24 hr.	—	—	24 hr.	—	—
Dilution 1–1,000,000			Dilution 1–1,000		
10 min.	+	+	10 min.	+	+
30 min.	+	+	30 min.	+	+
1 hr.	+	+	1 hr.	—	+
24 hr.	+	—	24 hr.	—	—

B. coli. It is possible that organisms may recover from gentian violet treatment more readily than from mercurochrome, but the experiments summed up in Table IV show little if any difference on that score even with the use of higher dilutions of gentian violet.

The adoption for therapeutic use of the one rather than the other must be conditioned on other factors as well, however. Such things as stability of solution, eventual innocuousness, possible immediate reaction, compatibility with local anesthetics and alkaloids, etc., must be considered.

These and other factors are discussed in the next paper from the point of view of the published clinical results on both dyes.

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PART II. CLINICAL RESULTS

STRICTLY SPEAKING, the clinical value of mercurochrome and gentian violet as internal antiseptics has not been established. Yet from the extensive literature on these subjects one gains the feeling of assurance that certainly the field offers much promise. Most of the earlier published results concerned cases where positive and beneficial, or at least encouraging, results were obtained. This is not true of some of the more recent reports, especially that of Brill and Meyers,[3] who state, on the basis of three cases of bacteremia and two of local gonococcal infection, that neither mercurochrome nor gentian violet in any way interfere with the "progress of the infection." They also adduce certain in vitro results purporting to show the antiseptic impotence of these dyes, but these experiments are not well conceived and, though suggestive, are not at all convincing.

It must be borne in mind that many of the cases reported in connection with the use of these drugs are those which do not lend themselves readily to the usual procedures and are often too readily called hopeless. Such cases are constantly furnishing ample opportunities for the trial of internal antiseptics, and the rapid increase of clinical experimentation with these two drugs makes it expedient to summarize the results already obtained as well as the possible attending dangers already brought to light. A careful survey of the literature has led to a comparative summary and this is given here in as concise a form as is considered adequate. For the most part, specific references are not cited, but a comprehensive bibliography, especially covering results on internal use, of work with these two drugs, is appended.

Finally, it must be always borne in mind that, although gentian violet is a straight triphenyl-methane dye (containing perhaps varying amounts of inert diluent—mostly dextrin), mercurochrome is a mercurial. Therefore, any statement that the latter is "safe" under specified conditions must be modified both by any specific supersensitiveness of the individual to mercurials, and by any specific ability of the individual to decompose the drug, liberating the mercury in a more toxic form.

ADMINISTRATION

The general opinion seems to be that 5 mg. per kilo body weight of either drug is both adequate and, in general, safe for a single injection. Though a 1 per cent mercurochrome solution seems advisable,

only a 0.5 per cent solution of gentian violet should be employed. It should be pointed out in passing that, since the molecular weight of the mercurochrome is about double that of the gentian violet, such solutions, though apparently widely different in strength, are practically equivalent in concentration.

For the most part, it is better to give a more moderate quantity at one time and repeat the treatment. Gentian violet can be given safely every second or third day, four or even more injections being perfectly safe. With mercurochrome, however, the number of injections should be determined by its effect upon the kidneys.

INHIBITING STRENGTH FOR ORGANISMS

Few comparative results are available. But in Part I the authors present some in vitro results.

In the case of gentian violet it has been found that urine, after intravenous injection of the drug, is markedly antiseptic for Staphylococcus aureus and moderately so for *B. coli*. One part in 5,000 in urine mixed with salt solution has been found to kill the latter organism in one hour, while one part in 10,000 is effective for the former organism under the same conditions. In the case of mercurochrome the statement is made that 1:600 in blood serum "kills bacteria." Such a concentration would, however, be fatal to the individual as well as to the bacteria. Certainly 1:10,000 of either drug, a safe concentration in the blood stream, does not actually kill any bacteria in media enriched with blood even after several hours, although "killing" of bacteria is by no means necessary for beneficial results.

Bile, after intravenous injection of mercurochrome, has been shown to be "bactericidal" when inoculated with Eb. typhi, and urine, after a single injection of this drug, shows increased bactericidal action toward *B. coli*. Blood also shows this increased action a few minutes after injection—15 to 45 minutes—which effect then disappears.

For intravenous use freshly prepared solutions are always to be preferred, though in the case of gentian violet no effects have been reported which indicate decomposition into a more toxic substance. Mercurochrome, on the other hand, occasionally produces effects which indicate a more specific action of mercury—salivation and intestinal symptoms. Its solutions thus seem occasionally to tend to break down and cannot be invariably relied upon.

IMMEDIATE REACTION PRODUCED UPON INTRAVENOUS INJECTION

With gentian violet there is usually a chill accompanied by a drop in blood pressure and often a low pulse. Under certain conditions there is cyanosis but this soon passes off. Sweats, as well as the above mentioned chill, seem produced by either drug. With mercurochrome, however, the pulse becomes rapid in many cases and there is a rise in temperature. Occasionally, there is severe nausea and vomiting.

INNOCUOUSNESS

The effect on the heart has been noted above, the gentian violet often causing a low pulse while the mercurochrome tends to cause a rapid pulse. On the kidneys no effect of gentian violet has been recorded. It is on these organs, however, that mercurochrome has its most harmful and dangerous action. Cases of stomatitis, nausea, diarrhea, edema of face and ankles have been reported. Urine at times shows albumen and casts. Occasionally, there is salivation and there have been reports of severe pains and of loosened teeth. In rabbits small doses produce mild effects proportional to the dose. Ten mg. per kilo does definite renal damage. Half this dose causes only slight damage, so that in 2 months the kidneys show no evidence of previous damage. One autopsy of an unsuccessful case showed kidney lesion of parenchymatous degeneration with fatty infiltration.

The colon may also be seriously af-

fected by mercurochrome. The autopsy mentioned above showed necrosis and degeneration of the surface of the colon with edema and hemorrhagic extravasation deeper. In this case, analysis of viscera showed the presence of more mercury than is usually found in cases of bichloride poisoning. One fatal case of colitis has been reported. The claim is made that excretion of the dye part of mercurochrome begins at once with normal kidneys, 30 per cent or more being excreted in 24 hours.

On the blood cells it is stated that gentian violet at a dilution of 1:50,000 has no deleterious effect on the white cells after exposure for 2 hours; although a study of 11 cases of severe septicemia following operations in which gentian violet was administered intravenously showed there were 4 cases in which the white count decreased and 1 in which it increased. Mercurochrome is said to destroy some of the red cells; this effect has been found to decrease, if it is injected in the presence of blood serum or plasma. Mercurochrome is said to increase the leucocyte count sometimes.

In studying the effect of mercurochrome on the lungs of dogs it has been found that, whether given subcutaneously, intratracheally or intrapleurally, it causes permanent parenchymal damage.

At the site of injection thrombosis of the vein has been noted when a 1 per cent solution of gentian violet has been used. Such a solution is, however, about double the molecular concentration of a 1 per cent mercurochrome solution. With a 0.5 per cent solution properly administered no thrombosis occurs. Thrombosis has not been noted with mercurochrome.

Autopsies of unsuccessful cases in which these drugs were used have yielded some comparative data. On a single autopsy, after use of gentian violet, no effect was noted—the tissues were not even stained. In several cases, after the use of mercurochrome the liver was white, kidneys were white and edematous, and mercury was recovered from these organs.

PRECAUTIONS TO BE OBSERVED

In administering gentian violet it is best to use a fresh solution made with a buffer adjusted to neutrality, filtered and warmed to body temperature. A small needle should be used to avoid thrombosis. In case of mercurochrome the proper precautions are more imperative and the principal ones are:

1. It should not be used where the red cell count is low as it destroys some of the red cells.
2. It is best to first secure a blood culture.
3. Very large or fat persons should be given less.
4. The state of the kidneys should determine whether or not injection of the drug should be repeated.
5. Strong solutions should not be given until weaker concentrations have been tried. Even a 1 per cent solution may cause stomatitis.
6. It should be administered only while the patient is still displaying resistance toward the infecting organism.

It is claimed that certain of the toxic effects can be lessened by administering a 12 per cent solution of sodium thiosulphate, either by mouth or by vein, with the mercurochrome treatment.

These precautions are for the intravenous use of the mercurochrome.

For other uses it is well to note the following facts in the case of this drug: local anesthetics—alkaloids, such as procain, quinine, urea hydrochloride, stovain, etc.—give precipitates, when treated with a 2 per cent solution of mercurochrome. Such precipitates are sufficiently insoluble to render dangerous the concomitant use of mercurochrome with any of these. One case is described where injections into the bladder of a 2 per cent mercurochrome solution were causing severe burning. To relieve this, 30 c.c. of 1 per cent procain, followed in 5 minutes by 45 c.c. of the mercurochrome, were injected. After 3 hours the patient was unable to urinate, and catheterization showed numerous pieces of solidified

mercurochrome precipitate. This had finally to be dissolved by injecting 1 per cent sodium carbonate.

SUMMARY

General opinion as to the intravenous use of these 2 drugs may be summed up as follows:

Results with mercurochrome indicate the fact that recoveries are sometimes brilliant, but the drug should be given only under urgent conditions and then with extreme caution.

Results with gentian violet are at least as brilliant as with mercurochrome, and are besides apparently accompanied by no harmful effects. Its use seems innocuous when administered slowly enough and in amount not above 5 mg. per kilo body weight.

Thus, for intravenous use gentian violet seems a shade more promising than mercurochrome, due largely to the possible ill effects of the latter. This would be especially the case if we grant the mechanism of their action in the blood as formulated by Chapman, who says, "Of course, we are agreed that the action of mercurochrome is not directly on the organism, but that these non-specific irritants merely increase the number of leucocytes, and it is the leucocyte which attacks the organism." Even though the authors are by no means in agreement with this postulated mechanism, they feel that results, on the whole, indicate a distinct advantage of gentian violet over mercurochrome for intravenous use.

The fact must not be lost to sight, however, that there are many cases of localized infections where there is no reason for postulating non-specificity, and where the drugs may act directly on the infecting organism. In such cases both drugs have their distinct places and in many such cases mercurochrome may possess distinct superiority over gentian violet.

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AN EPIDEMIC OF TYPHOID FEVER FOLLOWING A CHURCH DINNER

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INFORMATION reached the Michigan Department of Health on December 12, 1925, that 8 people in Eaton Rapids, a village fourteen miles from Lansing, were suffering from typhoid fever. Although it was believed locally that these cases were due to pollution of the municipal water supply, a preliminary review of the situation by an epidemiologist and a sanitary engineer failed to confirm this opinion. The investigators found that all of the patients had been guests at a public dinner served on November 18 by the Ladies Aid Society of one of the Eaton Rapids churches. This occasion was unlike the dinners given each month by the society in that, besides approximately 182 local residents, it was attended by 68 students from the Michigan State College at East Lansing. On December 13, it was discovered that 9 of these students had become ill with typhoid fever, and that 2 women from the city of Lansing who were dinner guests had contracted the same disease. Later, 16 more persons in Eaton Rapids were found to be confined to bed with diagnoses of typhoid fever—making a total of 35 cases among those who attended the dinner.

Prior to this occurrence, Eaton Rapids, a community of about 2,500 inhabitants, had been comparatively free from typhoid fever. Two cases had been known to exist there in May, but until the latter part of November no others were reported in 1925. Only 2 death certificates from this cause had been filed during the previous 6 years. In December, 1924, a student at the Michigan State College was a typhoid fever patient. No cases had occurred at the college since that time. Five cases were reported in the city of Lansing in October, 1925, and 1 in November. For 35 individuals belonging to these different population groups to be attacked almost simultaneously in the winter season was a decidedly unusual event, and the fact that there were no typhoid fever cases, either in Eaton Rapids or at the Michigan State College, except among those who attended the dinner, pointed towards a relationship between the gathering and the outbreak.

PROCEDURE OF INVESTIGATION

Because of this association, it was necessary to review everything connected with the dinner in considerable detail. A physician visited each case of typhoid fever, confirmed the diagnosis, and obtained specimens of blood and feces for laboratory examination. Routine case cards which called for an account of all the facts concerning the patient and his environment were filled out. In addition, a special record form listing the dinner menu was used. The patient was asked to enumerate the articles of food he had eaten, and these were checked on the form provided for the purpose.

An attempt was made also to reach those who had attended the dinner, but remained in apparently good health. No accurate list of the guests was available, but through those first interviewed it was possible to obtain records from 222 of the estimated 250 people who partook of the meal. The special form used called for the following data: name, sex, age,

address of the guest, previous history of typhoid fever and typhoid vaccination, present state of health, and the articles of food eaten at the dinner.

These histories and records were secured from the 68 college students, and in addition each student was examined for clinical signs and symptoms of typhoid fever. Specimens of blood and feces from each student were sent to the laboratory. During the course of these examinations 3 previously undiagnosed cases of typhoid fever were discovered.

The sources and methods of preparing the articles of food served at the dinner were investigated. Thirty-four women and 2 men were contributors or assisted in serving the dinner. Each of these individuals was questioned regarding the ingredients of the dish furnished, and the way in which it was prepared. The forms devised for this purpose called for the following information: name, sex, age, address, history of typhoid fever, history of typhoid vaccination, history of recent illness, and attendance at the dinner of the contributor and each member of his household. The item on the menu contributed, the raw materials used and where they were bought, the method of preparation, and the names of those assisting in preparing the food were asked. One or more specimens of blood, and of feces were obtained from each of the 36 contributors except from 4 women who gave only raw food products purchased from grocery stores and not handled by the individual.

EXAMINATION OF DAIRIES AND MILK HANDLERS

An exhaustive survey was made of the dairies in Eaton Rapids and their sources of supply. This survey included the examination of blood and feces from milk handlers. Because of the local disposition to attribute the epidemic to the water supply this was investigated by a sanitary engineer and samples of water were examined. The results of both of these surveys were negative.

CLINICAL AND LABORATORY FINDINGS

Clinically, the epidemic was characterized by severe protracted illnesses among those attacked, and by a high mortality. In the majority of cases, the febrile period was of 4 weeks' duration or longer. Intestinal hemorrhages were a frequent complication. Relapses are known to have occurred. Six of the 35 patients died. Positive laboratory findings were obtained from 33 of the cases. Positive blood cultures were obtained from 10 cases, and typhoid bacilli were found in the feces of 25. The sera of 32 patients were examined and found to agglutinate typhoid bacilli in dilutions of 1:1280.

The blood sera of 6 college students who showed no symptoms, and who had no previous history of typhoid fever, or of typhoid vaccination, gave positive Widal reactions in dilutions of 1:640 on the twenty-fourth day after the dinner. Second specimens on the twenty-sixth day gave similar results, but on the ninety-ninth day after exposure no agglutination took place. On three examinations the feces of these students were negative for typhoid bacilli.

The patients exhibited classical physical signs and symptoms which, together with positive laboratory findings, definitely proved that they were suffering from typhoid fever, and 6 dinner guests who were not ill presented laboratory evidence of infection.

CHRONOLOGY, AGE AND SEX OF CASES

The 35 cases are listed according to the date of their first symptoms, and the date of taking to bed in Table I.

The time elapsing between the dinner and the date upon which the patient became ill varied between 2 and 42 days. These variations, together with the intervals between the onset of first symptoms and the date of taking to bed, are consistent with the incubation periods of typhoid fever observed in other epidemics.[1]

The 222 dinner guests from whom records were obtained include all of the

college students. It is believed that the age and sex distribution of the 28 Eaton Rapids residents who were not interviewed corresponds with that of the remainder of the same group. In the tabulations which follow, corrections to include all of the 250 guests have been made.

TABLE I

ONSET OF TYPHOID FEVER CASES BY DAYS ACCORDING TO THE DATES OF THEIR FIRST SYMPTOMS AND THE DATES OF TAKING TO BED

Number of Days Following Dinner	Number of Cases According to: Date of First Symptoms	Date of Taking to Bed
2	1	0
3	0	0
4	0	0
5	0	0
6	1	0
7	3	0
8	1	0
9	1	0
10	4	0
11	2	1
12	1	1
13	4	0
14	2	1
15	1	1
16	2	0
17	1	1
18	0	2
19	1	3
20	4	2
21	4	1
22	0	2
23	0	5
24	0	5
25	0	0
26	0	4
27	0	1
28	1	0
29	0	1
30	0	1
41	1	0
42	0	0
43	0	1
Total	35	33

NOTE: The date of taking to bed of two cases is unknown.

Specific attack rates according to the age and sex of those who ate the dinner are shown in Tables II and III.

While these rates undoubtedly show age and sex distribution correctly, they do not necessarily represent the proportion of those actually exposed to infection who became ill. There are no very significant differences between the rates. The college students, all young adult females, and the Eaton Rapids men, women and children of various ages were attacked with almost equal frequency, the attack among the former group being 13.23 per cent and among the latter 14.29 per cent of those who ate the church dinner.

Three of the fatal cases were males and 3 were females. Five were between 20 and 49 years old, and 1 was 69 years old. Like the incidence of typhoid fever, the mortality from the disease was not confined to persons in any limited age group and corresponded to the age distribution of those exposed.

THE SOURCE OF THE EPIDEMIC

Casual inquiries gave no clue as to the articles of food, or the other factors connected with the dinner which were responsible for the epidemic. Suspicion was naturally directed to uncooked foods; but none of these was eaten by all of the patients. The menu served, the number of those attending the dinner who remained well, and the number of typhoid fever cases who are known to have eaten each item listed are shown in Table IV. Those who failed to remember whether or not they partook of certain dishes on the menu are classified as doubtful.

TABLE II

PERSONS ATTENDING DINNER, NUMBER OF TYPHOID FEVER CASES, WITH SPECIFIC ATTACK RATES PER HUNDRED FOR CERTAIN AGE GROUPS

Age Groups	Number Attending Dinner	Number of Typhoid Fever Cases	Specific Attack Rate Per Cent
0–19.....	72	9	12.50
20–49.....	116	19	16.38
50 and over..	62	7	11.29
Totals.....	250	35	14.00

TABLE III

PERSONS ATTENDING DINNER, THE NUMBER OF TYPHOID FEVER CASES, WITH SPECIFIC ATTACK RATES PER HUNDRED FOR EACH SEX

Sex	Number Attending Dinner	Number of Typhoid Fever Cases	Specific Attack Rate Per Cent
Male.....	66	12	18.18
Female.....	184	23	12.50
Totals.....	250	35	14.00

Three articles of food were eaten by nearly all of the typhoid fever patients from whom complete histories were obtained—turkey, potatoes and squash. The examination of those, who provided for and served the dinner, confirmed the obvious inference that the epidemic was caused by one of these three items on the menu. The specimens of feces obtained from 35 of the food handlers, including 5 women who gave previous histories of

TABLE IV

TYPHOID FEVER PATIENTS, AND PERSONS NOT ATTACKED WHO ATE, OR DID NOT EAT EACH ARTICLE OF FOOD SERVED

Article of Food	Typhoid Fever Cases			Persons Not Attacked		
	Number Eating	Number Not Eating	Doubtful	Number Eating	Number Not Eating	Doubtful
Turkey	34	0	1	151	36	0
Potatoes	33	0	2	172	15	0
Squash	32	0	3	122	62	3
Pie (all kinds)*	29	1	5	154	32	1
Bread or rolls	27	5	3	167	18	2
Butter	27	4	4	159	26	2
Cabbage salad	25	6	4	120	62	5
Water	24	6	5	96	83	8
Coffee	23	10	2	128	56	3
Cranberries	22	9	4	134	49	4
Gravy	21	0	14	127	8	52
Cream	19	15	1	116	68	3
Cheese	18	11	6	74	103	10
Dressing	17	3	15	128	19	40
Pickles	16	13	6	74	105	8
Number interviewed		35			187	

* The kinds of pie served have been grouped together. No single variety was eaten by more than 10 of the patients.

typhoid fever, were negative. Typhoid bacilli were isolated from both the feces and the urine of the thirty-sixth contributor. The blood serum of this woman gave a negative Widal reaction, a finding which placed her in the group of carriers who show no agglutinations.[2] Second, confirmatory examinations of this woman's blood and feces gave similar results.

HISTORY OF THE TYPHOID CARRIER

The history of the discovered carrier, who will be called Mrs. A, was as follows: She suffered from an attack of typhoid fever in 1900 when she was 48 years old. Four of the five other members of the family were afflicted with the disease at the same time. The fifth, her husband, had typhoid fever 35 years previously. Mrs. A's son married a few years later and brought his wife home. While living with her mother-in-law the younger woman developed typhoid fever. This is the only previous case which could be associated with Mrs. A. That Mrs. A was not clearly responsible for more cases can perhaps be explained by the fact that all of her family had had typhoid fever, and by her comparatively isolated place of residence on a farm.

The dinner on November 18 was the first of such occasions to which Mrs. A had contributed since the family left the farm and moved to Eaton Rapids. She furnished an apple pie, and a half gallon of squash. As a causative factor, the apple pie can be excluded because only 5, or 14.38 of those attacked partook of this variety of pie.

The squash which she contributed was steamed by Mrs. A the evening before the dinner and placed in the refrigerator. In the morning Mrs. A set the squash on a hot air register to warm. She decided that the quantity was insufficient and boiled more squash. This was mixed with the original amount, and the whole mass stirred with a potato masher. A small quantity of butter, and a little milk which came from a local dairy, were added. The squash was then carried to the dinner. It was placed in serving dishes almost immediately and then on the dinner tables so that the guests could help themselves.

Whether the squash contributed by Mrs. A was mixed with donations of the same vegetable from other sources could not be absolutely determined. The half gallon furnished by the carrier was 20 per cent of the two and one-half gallons of squash provided for the dinner, and was not a large enough quantity to serve very many people. If Mrs. A's squash were served separately, one would expect the occurrence of typhoid fever to be confined to individuals sitting together.

It would scarcely be possible to fill dishes enough for general consumption from the amount she provided. Since cases occurred among those sitting at each of the four large tables, it seems evident that the vehicle of infection must have been widely distributed.

Turkey and potatoes, as well as squash, were probably eaten by all those who developed typhoid fever soon after the church function, but the facts accumulated are decidedly in favor of the belief that squash was the source of the epidemic. Investigation of the manner in which the turkey and the potatoes were prepared brought forth negative results. Mashed potatoes were served. They were furnished, or cooked by 8 women, none of whom gave a history of previous typhoid fever or showed any laboratory evidence of infection. All of the turkeys were roasted at a local bakery by a man who had typhoid fever in 1915, but whose Widal reaction and feces were negative. This baker has conducted his business in Eaton Rapids for several years, and has never been under suspicion as a typhoid carrier. The dressing was prepared separately, and not baked with the turkeys.

Although the discovery of a typhoid carrier who furnished squash eaten at the dinner, and the negative results obtained from investigating the sources of the turkey and potatoes, seemed to prove that infected squash was responsible for the epidemic, certain additional evidence is of interest. A larger proportion of the guests who ate squash became ill than of those who used either turkey or potatoes. Of the 207 who probably ate potatoes, 35 or 16.91 per cent were attacked; of the 186 persons eating turkey, 18.82 per cent became ill; but of the 160 individuals who probably ate squash, 35 or 21.87 per cent developed typhoid fever. Further circumstantial proof is found in the fact that Mrs. A had not previously contributed to a similar occasion. Public dinners had been served each month by practically the same group of women, and none of them was followed by epidemics of typhoid fever.

The epidemiological and laboratory evidence available seems to justify the conclusion that the Eaton Rapids outbreak followed the church dinner on November 18, and that the vehicle of transmission was squash prepared by Mrs. A, a typhoid carrier.

DISCUSSION

In many respects, this outbreak during the winter season is a typical example of the results of a single heavy dosage of typhoid bacilli. The explosiveness of the epidemic and the large proportion of those eating the infected food who were attacked are frequent characteristics of mass infection outbreaks.[3, 4, 5]

The mean incubation period (date of first symptoms) in the Eaton Rapids epidemic was 13.171 ± 0.399 days. From his study of incubation periods, Miner[6] found that the means of three typhoid epidemics due to infected water supplies were 13.81 ± 0.83, 19.38 ± 1.66, and 19.50 ± 0.31 days, respectively, while the means of two outbreaks due to food were 7.0 ± 0.26, and 9.54 ± 0.39 days. These results agree with the view that the incubation periods of mass infection epidemics due to food are shorter than those of water-borne outbreaks. The Eaton Rapids experience does not conform to this more or less generally accepted belief. In spite of the severe clinical symptoms, and the high mortality encountered, the incubation periods were longer than those usually observed in similar epidemics.

Positive Widal reactions were obtained from the blood of 6 of the 59 college students who attended the dinner, but who showed no symptoms of disease. These 6 girls did not give histories of previous typhoid fever, or of typhoid vaccination. Since the specimens of feces obtained from them were negative, one naturally infers that the clinically well students acquired a temporary, local infection, their failure to show symptoms indicating that they were less susceptible than the

dinner guests who became typhoid patients. The development of agglutinins in the blood sera of persons exposed to typhoid fever but remaining in apparently good health has been observed by Scheller[7] in a milk-borne outbreak, and by Dennemark[8] in an epidemic following the eating of potato salad made by a carrier. Unlike the specimens from the 6 college students, the feces of 18 of Scheller's cases were positive for typhoid bacilli. The public health importance of infected persons without any clinical signs or symptoms of typhoid fever requires no comment.

The church dinner at Eaton Rapids was rather an important function. Perhaps because the college students were specially invited guests, many people of local prominence attended the banquet. All of them, except a single patient, were from professional and other indoor occupations, or had no lucrative employment—a situation like that found by Lumsden[9] while investigating the oyster-borne epidemic in Chicago.

One person eating the dinner who gave a history of previous typhoid fever in 1918 was attacked. There were 12 male and 11 female guests who presented such histories. Eight men and 9 women had been vaccinated against typhoid fever at some time in the past. One of the women, who was vaccinated 6 years before the dinner developed typhoid fever.

Outbreaks of paratyphoid fever traced to an infected article of cooked food[10] are common, but recent literature contains few references to typhoid epidemics following the consumption of cooked rather than raw food. However, as shown by Sawyer,[11] in reporting an epidemic which very closely resembles the Eaton Rapids outbreak, the cooking of a contaminated food product by no means implies that it becomes bacteriologically sterile. The method used by Mrs. A in preparing squash would seem to afford excellent opportunities for its contamination after cooking, and for the growth of typhoid bacilli.

SUMMARY

An epidemic followed the church dinner served at Eaton Rapids, Michigan, on November 18, 1925.

Of the 250 dinner guests, 35 were attacked with typical and severe typhoid fever. There were 6 deaths.

Six of 59 college students attending the dinner, but showing no clinical symptoms, gave positive Widal reactions. Specimens of feces from these students were negative for typhoid bacilli.

The mean incubation period was 13.171 ± 0.399 days, a longer time than is generally associated with outbreaks due to infected food.

The epidemic was attributed to squash prepared by a carrier whose urine and feces were positive for typhoid bacilli, but who gave a negative Widal reaction.

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HEIGHTS AND WEIGHTS OF COLORED SCHOOL CHILDREN

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IN ESTIMATING THE state of nutrition, the relation of weight to height is a factor of recognized importance although by no means a substitute for a clinical estimate of nutrition. Because of normal variations from accepted standards, for height and weight relationships, care should be taken to safeguard the use of the accepted standards for comparisons, particularly with the measurements of groups with racial or other characteristics affecting their physiques and rates of growth. At present the standards used for determining height and weight deviations from a group average are based entirely or almost entirely upon data secured from white children.

In the development of the child health program in Rutherford County, Tennessee, the need for special information on height and weight relationships among colored children has been indicated. Accordingly, a study was made of the records of height and weight of 1,650 colored children and 4,101 white children as obtained during recent school health examinations in Rutherford County.

Robertson[1] in his discussion of the growth and development of children, states that "unfavorability of environment results in a parallel increase of deficiency in weight and stature." Holt[2] says, "Rickets greatly affects growth in height." As both of these factors are especially likely to be present among the colored, it might be expected that if the racial factor were not a dominant influence, colored children would be smaller and thinner than white children. In Rutherford County, however, colored children of school age were found uniformly heavier than white children of the same age, and taller than white children until toward the end of adolescence.

As stated above, the records of heights and weights of these school children in Rutherford County were secured in connection with making school health examinations.

As both colored and white children were examined throughout the school year any differences in their heights and weights from seasonal causes have been largely eliminated.

The number of colored and white children examined and the number of boys and girls in each age group are indicated in Table I.

Heights and weights were recorded after the children had removed their shoes and heavier wraps. Age was counted in relation to nearest birthday. Average heights and weights for colored and white are shown in Table II.

It is interesting to note in this connection that the height and weight figures for white children in Rutherford County approximate the figures obtained by Clark, Sydenstricker and Collins[3] in Maryland, Virginia, North Carolina and South Carolina, where environment and dietary conditions are in a general way similar to those in Tennessee. This indicates that the averages for white children in Rutherford County, upon which present comparisons are based, are much the same as those for children in other parts of this section of the South.

TABLE I

Distribution According to Age and Sex

Age Nearest Birthday	1650 Colored Children Number		4101 White Children Number	
	Boys	Girls	Boys	Girls
All ages	792	858	2012	2089
6 years	41	38	86	89
7 "	64	63	176	177
8 "	88	74	192	207
9 "	86	70	205	222
10 "	92	104	254	216
11 "	67	84	215	237
12 "	71	88	236	202
13 "	77	100	215	221
14 "	90	87	170	212
15 "	63	83	142	185
16 "	53	67	121	121

TABLE II

Average Heights and Weights for White and Colored Children by Sex and Age

	Boys					Girls				
	Height		Weight			Height		Weight	
Age	White	Colored	White	Colored	Age	White	Colored	White	Colored
6	45.2	44.8	46.2	45.6	6	45.2	45.2	45.4	45.0
7	46.7	47.0	49.3	50.1	7	47.5	47.5	46.9	49.3
8	48.9	49.3	54.7	56.2	8	48.4	48.9	51.5	53.0
9	50.8	51.1	60.0	61.5	9	50.6	52.1	56.8	63.5
10	52.7	53.5	65.0	67.8	10	52.7	53.5	64.1	66.6
11	54.3	55.0	70.2	73.8	11	54.7	55.6	71.1	75.5
12	56.2	57.5	76.6	82.6	12	57.0	58.9	80.3	89.5
13	58.5	58.5	86.0	89.8	13	59.0	80.5	83.8	99.4
14	60.5	60.9	95.0	99.4	14	60.8	61.7	100.7	107.1
15	62.9	63.8	105.9	115.3	15	61.9	62.2	109.5	115.4
16	65.1	64.7	118.6	126.3	16	62.8	62.0	109.0	122.8

MARKED DIFFERENCES IN ALL AGE GROUPS

In comparison with white children the colored children in Rutherford County for almost all age groups showed marked differences in both height and weight. The amount of this difference is shown in Table III and also in Charts A and B.

The figures given in Table III for average height would indicate that the colored children studied are somewhat taller than the white children between 6 and 12 years, but the difference then becomes less marked and at 16 the white child is slightly taller than the colored child.

COMPARATIVE GAIN IN WEIGHT OF COLORED AND WHITE CHILDREN

The figures for average weight show an increasing tendency for the colored child to gain in weight more rapidly than the white child, so that the average weight among colored children is in excess of the average for white children during each year between 6 and 16.

These tendencies are found among boys and girls, the differences between white and colored being apparently somewhat more marked for both height and weight among the girls than among the boys.

Similar differences between white and colored children of school age are shown in figures quoted by Holt, Bowditch and Porter.[4]

The figures in Table III are based on records of an unselected group of children. While all were supposedly well and in attendance at school, many showed some degree of malnutrition in the clinical rating. Table IV shows the average height and weight for the entire group of colored children in comparison with a group of 815 colored children graded clinically as having normal nutrition, being neither undernourished nor overfat.

While a considerable variation is shown in height relationships between the two groups, the average weight for the children with " normal " nutrition is consistently higher than for the entire group of children.

Before height-weight tables for age can

TABLE III

Relation of Average Height and Weight of Colored to White
(Figures indicate pounds or inches above or below white)

Age	Height		Weight	
	Boys	Girls	Boys	Girls
6	—0.4	0	—0.6	—0.4
7	+0.3	+1	+0.4	+2.4
8	+0.4	+0.5	+1.5	+1.5
9	+0.3	+1.5	+1.5	+6.7
10	+0.8	+0.8	+2.8	+2.5
11	+0.7	+0.9	+3.6	+4.4
12	+1.3	+1.9	+6	+9.2
13	0	+1.5	+3.8	+15.6
14	+0.4	+0.9	+4.4	+6.4
15	+0.9	+0.3	+9.4	+5.9
16	—0.4	—0.8	+7.7	+13.8

be constructed for colored school children, records of height and weight will have to be collected for a large number of colored children living in different sections of the country, preferably those with favorable clinic ratings for nutrition, so that averages for height and weight will be based on the records of children known to be in a good nutritive condition. The figures presented here are obviously too few in number and from too limited an area to warrant their use, without supplementary research, as the foundation for statistical height-weight tables, but it is hoped that they will prove of value in showing the desirability of further study leading toward the construction of such tables.

Studies elsewhere of relative heights and weights among colored and white infants and among colored and white adults show similar tendencies to those found among the younger and older children in the group studied in Rutherford County, and again certain marked differences between colored and white. It is interesting to note that the figures for Ruther-

CHART A

Variations in Average Heights of White and Colored Boys and Girls at Different Age Periods
Line AB represents average heights for white boys and for white girls

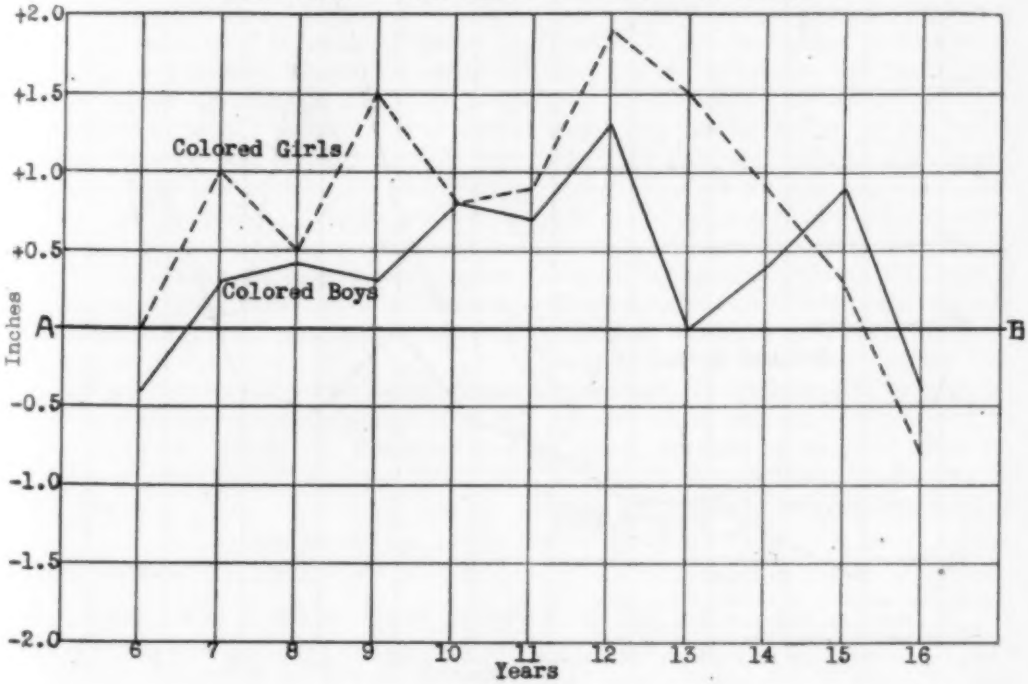

TABLE IV

Comparison of Average Heights and Weights of a Group of Colored Children Having Clinically Normal Nutrition with Average Heights and Weights of the Whole Group of Colored Children
(Figures indicate inches or pounds above or below average for whole group of colored children)

Age Nearest Birthday	Relation of the Average			
	Height of		Weight of	
	Boys	Girls	Boys	Girls
6	−0.1	−0.2	+1.2	+1.8
7	0	−0.6	+1.1	+1.6
8	+0.2	+0.2	+2.4	+5.8
9	−0.2	−0.5	+1.8	+0.6
10	+0.3	−0.4	+3	+3.7
11	+0.2	+0.2	+1.6	+4
12	−1.1	−0.1	−0.7	+3.1
13	+0.2	+0.1	+5.2	+5.1
14	0	0	+3	−1
15	+0.5	−1.9	+5.1	+2
16	+0.4	+0.2	+3	−1.2

ford County therefore fit very well into the gaps between studies of colored infants and preschool children and studies of colored adults.

Woodbury[5] reports as follows concerning the height and weight of colored children under six years of age, as compared with the same measurements for white children. "The average deficiency in stature is about two-fifths of an inch, or 1.3 per cent for boys, and one-fifth of an inch, or 0.8 per cent for girls. In weight the average deficiency is nearly 11 ounces for boys and 9 ounces for girls, 3 per cent and 2.5 per cent respectively. The deficiency in both stature and weight is

CHART B

Variations in Average Weights of White and Colored Boys and Girls at Different Age Periods
Line AB represents average weights for white boys and for white girls

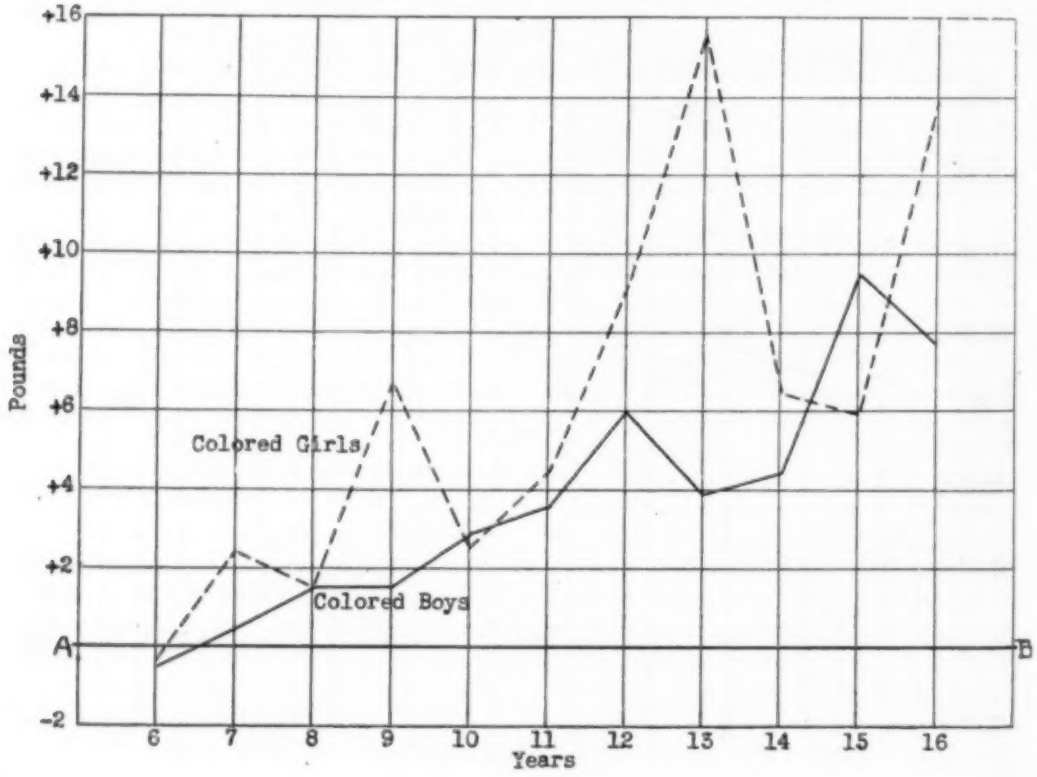

TABLE V

Comparative Statistics of White and Colored Soldiers. Mean Weight of White and Colored Soldiers According to Age and Stature

Stature (Inches)	Weight (Pounds)					
	Age 20		Age 25		Age 30	
	White	Colored	White	Colored	White	Colored
64.5	130.4	138.8	128.8	136.7	135.0	143.5
65.5	133.8	137.9	137.7	142.5	136.4	142.6
66.5	138.5	141.7	142.7	147.1	147.0	142.0
67.5	142.8	145.0	146.2	152.5	148.2	150.8
68.5	147.3	150.9	149.8	156.9	152.7	153.9
69.5	147.4	156.0	157.6	152.5	159.0	160.4
70.5	154.7	144.8	161.8	166.4	156.5	154.9

much greater at under 1 year and at 1 year of age than at other ages; in fact after 4 years this deficiency is either converted into an excess or is very small." The children of 6 years in Rutherford County showed also but little difference in height and weight among colored and white, indicating that at about this period the average height and weight of the colored child move up to equal the average height and weight of the white child, preparatory to exceeding them.

COMPARISON OF ADULTS

Among adults there is also apparently a tendency for colored and white to have about the same height, or for the white to be slightly taller. This is foreshadowed in the figures for the older children in Rutherford County. Thompson and Britten[6] found the average height of male workers to be 67.9 inches for both white and colored, this being somewhat less than Hrdlicka's average of 68.6 inches for "old Americans." As the white children in Rutherford County are almost entirely of native stock, this may account for the slightly taller white children in Rutherford County among the older age groups.

The weight of colored males was shown to be uniformly above the weight of white males in the studies of Thompson and Britten,[6] the weight averages being as follows:

	25–29 yrs.	30–34 yrs.	35–39 yrs.
Colored	153 lbs.	161 lbs.	163 lbs.
American White	149 "	151 "	154 "

Gould found a similar excess in the average weight of colored soldiers in comparison with white soldiers of the same age and stature. His figures are given in Table V.

Again, the heavier weight of colored adults is what would be expected from the figures for school children in Rutherford County, with their strong indication that colored children of school age in this area increase in weight more rapidly than white children and that their average weights are at all ages above six in excess of the average weights of white children of the same age.

SUMMARY

As yet the comparative data available for height and weight of colored and white at different age periods are very scanty, but the consistency in differences shown in this and other investigations would seem to indicate that the colored race has a growth cycle which differs in many respects from that of the white. The collection of additional data would perhaps bear out the tentative conclusions reached in the Rutherford County study as to the nature of height and weight variations between white and colored school children at different age periods.

Because of these differences it would seem highly desirable that further data be secured on heights and weights of colored school children, from which to judge of the need of standard tables for such children and from which to construct such tables if the apparent need of them is confirmed.

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SEPTIC SORE THROAT IN GUILFORD, CONN.

The outbreak of septic sore throat now subsiding in Guilford presented a puzzle in diagnosis until laboratory results were obtained. Many patients at first had only a mild or moderately severe sore throat. After two or three days the symptoms abated, the patients felt well and went back to work. Then followed in several cases a relapse, often with severe abdominal symptoms. The symptoms on relapse were so severe as to completely overshadow the early throat condition. Abdominal symptoms had not been observed particularly as complicating former outbreaks of septic sore throat in Connecticut. Sore throat may be due to so many causes that doctors dealing with this outbreak hesitated to assign a cause until laboratory reports were received.

A kind of germ called hemolytic streptococcus was found in the blood cultures of two patients. Another patient at autopsy was found to have died of streptococcus peritonitis. Thus it was apparent that the disease was due to a streptococcus, that this particular strain of streptococcus had a tendency to cause septicemia (blood poisoning) and peritonitis, and that the diagnosis should be septic sore throat rather than some strange hitherto undiscovered malady. Thus the elusive streptococcus demonstrates anew the reasons for its being a much feared germ. Five of the cases in the Guilford outbreak terminated fatally after relapse up to August 15, 1926.

In spite of its puzzling aspects a common factor was discovered for the Guilford outbreak in 28 hours from the time the State Department of Health first began its investigation.

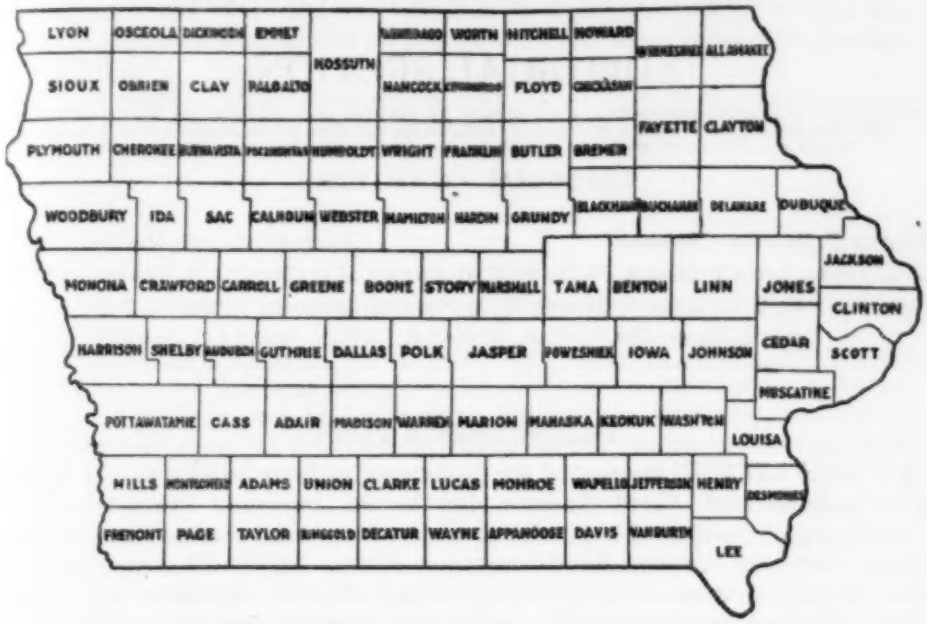
Milk had been supplied to Guilford from 4 dairies supplying 225, 200, 60 and 40 quarts per day respectively. No milk was pasteurized. A check-up of the first 64 cases concerning which detailed information was collected showed that 2 cases had used milk from the 225-quart supply, 58 cases from the 200-quart supply, 1 case from the 60-quart supply, and no cases from the 40-quart supply. In addition 3 cases in one family had used milk from their own cow. Of these 3 one became ill a few days before the others, thus apparently the other 2 contracted the disease from the first case.

This information left no doubt as to the source of many of the cases. Fifty-eight cases on two-fifths of the milk supply as against three on the other three-fifths could not possibly be the result of chance distribution. Accordingly, the proprietor of the dairy was given the option of pasteurizing the milk or stopping its sale. The latter was chosen.

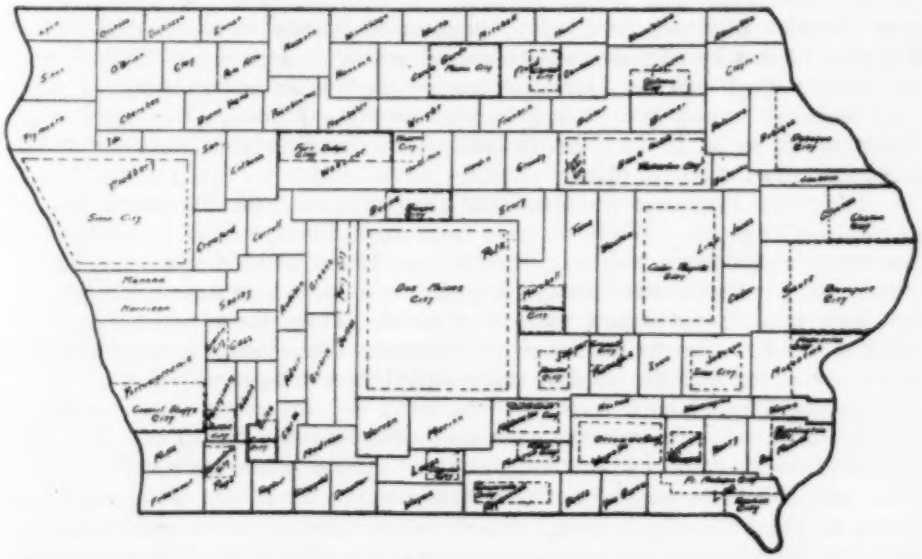
According to present views the streptococcus causing septic sore throat is of human origin. The germs may reach the milk either directly from a human case or carrier, or indirectly through a cow becoming infected from such case or carrier. In order to safeguard the public from further danger of infection by the same milk supply, careful examinations of all cows and all milk handlers connected with the dairy are now under way. When these examinations have been completed and both cows and milk handlers proven free from infection, the milk from this dairy will be safer than other milk of similar grade where such recent examinations have not been made.

Up to August 15, the State Department of Health had investigated 169 cases, and still had 19 cases listed for investigation, making 188 in all. This includes cases reported by physicians and discovered through inquiry. New cases have ceased to appear. No apprehension is felt as to further spread of the disease. It is likely, however, that some additional existing cases will be discovered.—*Health Bull.*, Connecticut State Dept. Health, Aug. 16, 1926.

POPULATION MAP FOR HEALTH OFFICERS



A—ACTUAL MAP OF IOWA BASED ON COUNTY AREAS.



B—For epidemiological purposes the Iowa State Department of Health uses the above map to visualize immediately the relative incidence of disease, the area and the population of the area. Each case of reportable disease is reported day by day throughout the month and indicated on the map by colored pins. The map is drafted to show the relative area that each county and city of 5,000 population or over would occupy if in the total area of the state the population were uniformly and equally distributed throughout the state.

State health officers find this map superior to the usual spot map in obtaining a comparative idea of the incidence of disease in their territory. County health officers can utilize a similar county map drafted to indicate the towns and townships within the county.

This map was designed by J. W. Wallace, M.A., M.D., C.P.H., of the Iowa State Department of Health.

EDITORIAL SECTION

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THE SEYMOUR PLAN

AT THE RECENT meeting of the Conference of State and Provincial Health Authorities of North America, Dr. M. M. Seymour, President of the Conference, proposed a plan for drives against diphtheria, smallpox and typhoid fever. The plan provided for devoting two months during the coming year to each of these diseases. During September and October, diphtheria will be the object of attack, smallpox in November and December, and typhoid fever in January and February, 1927.

The idea is to take advantage of the "crowd action" to which our public has been educated. All proper agencies for spreading the propaganda are to be employed. The prevention of communicable diseases is to be stressed, and it is believed that by intensive and concerted action throughout the United States and Canada much can be done to overcome the inertia and carelessness which is so prevalent among people in general, even the educated. The agencies for this drive are to be the local health authorities, though physicians will be asked to coöperate to the fullest extent.

As far as diphtheria and smallpox are concerned, this movement has our heartiest endorsement. While we have been markedly successful in lowering the death rate in diphtheria, we have done little to lessen its incidence. Smallpox is entirely too prevalent, and during the past few years a number of outbreaks of the highly fatal hemorrhagic type have occurred. There seems to be no question that this has been due to neglect of vaccination. The disease is so rare and so mild as compared with the old days that people forget to be afraid of it.

In regard to typhoid fever, we commend any drive which will teach the facts or insist on pure water supplies and other sanitary measures. We doubt that the time has come for vaccination of the general public against this disease. It can and should be pointed out that such methods have been wonderfully successful in armies, and in closely settled communities in which epidemics were occurring, or in which the endemic incidence was high. We believe that some caution should be exercised in recommending general anti-typhoid vaccination. We have highly effective ways of protecting communities against typhoid which are not available in the cases of diphtheria and smallpox, and the opposition which this campaign will undoubtedly arouse will be needlessly increased by the inclusion of typhoid vaccination to the possible detriment of the plan for

smallpox and diphtheria. We have, however, the utmost confidence in the protective value of typhoid inoculation, as has been abundantly proved, especially during the World War, and we believe it is highly desirable for those who are not in protected communities or may be otherwise exposed to risks especially through travel.

The Seymour Plan is full of interest and will certainly have great value. Its progress and results will be eagerly watched.

MATERNAL MORTALITY IN THE UNITED STATES

IT HAS OFTEN been pointed out that the prolongation of life, about which we talk so much, has been brought about chiefly by saving children under five years of age. The unpleasant fact remains that we have done very little toward saving children during the first three months of life or toward lessening maternal mortality.

The Children's Bureau has recently sent out an analysis of maternal mortality of the United States for the present century, made by Dr. Robert Morris Woodbury, which is not flattering to us as a nation. The writer can remember being called to order less than ten years ago for making a statement concerning the high maternal death rate in the United States. The present analysis, while not stating the actual position which we hold in respect to other nations, says distinctly that our maternal death rate is among the highest in the civilized world, and that very little decrease has occurred since the beginning of the present century. In fact, the figures show on their face an actual increase in the maternal death rate since 1900 of 3.6 per cent. Careful analysis and justifiable correction however enable Dr. Woodbury to make the statement that there is a "very slightly downward trend" since 1900. It is further shown that we rank among those nations of the world having the highest maternal death rate, such as New Zealand and Chile, while there is a formidable list of countries which have rates less than one-half of our own. Actually, more than 20,000 women lose their lives yearly in childbirth.

Approximately 100,000 deaths yearly occur in infants under one month of age. In addition to this there are at least 100,000 stillbirths annually. The mortality in these two classes is dependent to a great extent upon the care of the mother during pregnancy, confinement and the postnatal period, so that it is clear that anything done for mothers will improve the chances of life for infants.

The greatest single cause of maternal death is puerperal septicemia due to lack of surgical cleanliness. In this connection, the survey shows that even in cities with numerous and excellent medical schools and abundant hospitals and clinics, nearly one-half of all married mothers receive no prenatal care, and only 5 per cent receive care that could be classified as Grade A. In other cities without such facilities, as high as 70 per cent of the mothers receive no medical prenatal care, while in the country districts, a still smaller portion have such supervision. Fortunately, the risks in the country do not seem to be as great as they are in cities, since cities generally show a higher mortality than the rural districts. Puerperal septicemia is less common in the large cities than in those running from 25,000 to 50,000.

The report offers a challenge to physicians of the United States. It is accompanied by a preventive program which we quote and most of which we can endorse:

1. Regulation of the practice of obstetrics, by requiring a license to practice from both physicians and midwives, by establishing minimum requirements for obtaining such a license, and by defining and prescribing penalties for malpractice

2. Regulation of public and private hospitals and maternity homes through legal provisions governing the establishment of such institutions and requiring that they be licensed and subject to inspection

3. Legislation for the control of venereal diseases including the making of these diseases reportable

4. Requiring that puerperal septicemia be made reportable, as is now the case in a number of states

5. Provision through governmental or public sources of better facilities for training medical and nursing personnel and more adequate clinics, hospitals, and maternity homes

6. Subsidies in aid of state or local activities by federal or state governments, as in the United States during the past four years through the Maternity and Infancy Act

7. Educational work directed toward informing mothers of the need of adequate maternity care.

CAVEAT EMPTOR!

THAT THE IDEA of clean food has taken firm root in the public mind is evidenced by the wide use of the words purity, sanitation, wholesomeness, quality, etc., which advertisers are using far and wide in describing their wares. This is an age of package foods. Ordinary products of all sorts are put up in packages of various kinds and sizes, ornamented with splendid wrappers in blue and gold, for which the public pays under the idea that it is receiving something which has been prepared with special care or is of superior quality. This is unquestionably true in a number of cases, but in others there is abundant evidence that the manufacturer is using this means to delude the public and to palm off foods which are not up to standard.

The writer has seen bread being wrapped by hands which were none too clean and by fingers which were moistened with saliva for each sheet of paper. We have, from high authority, an instance in which the sugar icing used for decorating candy eggs for the Easter trade was kept at the right consistency by saliva, yet the superintendent saw nothing amiss. Similar instances familiar to all sanitary inspectors could be cited.

Behind these objectionable practices, we find ignorance or lack of conscience or both. In many factories the operatives are entirely devoid of an intelligent grasp of the rudiments of sanitation, factories in buildings which in themselves make production of clean products impossible, while the manufacturers in their advertisements lay stress upon the requirements of cleanliness and sanitation and the extra value of products produced according to hygienic methods. Other manufacturers have full knowledge of the harmful quality of the products they put out, and some have even stated that it is cheaper to pay occasional fines for substitution and adulterations than to use first class material. In some instances education is all that is required, in others nothing short of criminal action will help.

Business methods on the whole are improving and the alert manufacturer recognizes that continued success depends upon quality rather than upon outside appearances. In such cases the old adage, "Caveat Emptor"—let the buyer beware—has no foundation. The manufacturer recognizes his responsibility and accepts it. The consumer, however, has no way of telling what products are properly prepared and what are not. He is dependent upon his retailer, who with the best intentions may be misled. Trade marks and firm names go for a great deal with the retailer as well as with the consumer.

The consumer desiring the better product has no criterion for selection. The producer of wholesome products is deserving of separation from the unscrupulous. In order to identify those institutions making adequate provisions for the protection of the consumer and the people in the employ of such institutions, a private laboratory conducted by recognized sanitarians and hygienists proposes to award a "Sanitary Label" as a token of reliability. To obtain the award of this label the applicant for its use must make initial conformity with appropriate standards, and thereafter continuously maintain these provisions together with the additions, which developments in sanitation make desirable. It is suggested that an impartial council from the Fellows of the AMERICAN PUBLIC HEALTH ASSOCIATION and others serve as advisors in the creation of appropriate standards for the conduct of such certifying laboratories as well as for the meticulous "standards" which will be found necessary for varied procedures, and serve as arbitrators in matters of dispute. The details of frequent inspection of institutions and the securing of adherence to imposed provisions will fall upon the private laboratory undertaking the responsibilities of certification. The label, when awarded (and so long as merited), may then be used by the manufacturer in advertisements. Without restrictions, this label should be available to any firm or incorporation meriting its use, and not become the exclusive privilege of one alone against a competitive field.

We are inclined to believe that a field exists for such an enterprise. Its success will depend upon the rigidity with which standards are created and maintained. Basically, the question is one of the encouragement of private capital and expert services in the promotion of much needed health measures in many lines of business.

SMALLPOX AND CLIMATE

THE DEVELOPMENT of bacteriology revolutionized our ideas concerning disease. Not only has it changed our entire conception of the practice of medicine but our epidemiological ideas had to be entirely remade. We have probably neglected some methods of value which the older physicians made use of and it is probable that we have discarded some ideas which were useful. Certainly our studies have narrowed in their scope.

Among the influences which we have been inclined to neglect is climate, or at least certain aspects of climate, and season. It is true that many effects which were formerly attributed to season are more readily, and more accurately, explained than they were by the older ideas, but there still remain certain factors which cannot be overlooked and the explanation for which is not clear. No satisfactory explanation has been given of the pandemics of influenza, for example, though there is certainly some factor or factors involved other than those which are evident.

A most interesting study has just come from the Medical Research Council of England.[1] India has a well defined rainy season from the middle of June to the early part of October, followed by four months of dry, cold weather and then by four hot, dry months. Marked variations occur in the rainfall, temperature and humidity in different areas, the whole affording an excellent field for epidemiological studies in a tropical climate. Excellent records have been kept for more than fifty years and it is these records which Sir Leonard Rogers has made use of in his work. He has shown that there is a close relationship between high rainfall and the prevalence of leprosy; between moist monsoon currents, apart from the actual amount of rainfall, and the phthisis rates; between great diurnal variations of temperature, combined with a low minimum and a dry atmosphere, and pneumonia. The present study is devoted to the relation of smallpox epidemics to the variations of the climate in India, and it has further developed the thesis that outbreaks of smallpox can be foretold two or three months ahead, a matter of great importance, since it enables the health authorities to organize for additional vaccination and to prepare in other ways for the expected outbreak.

The facts upon which he bases these conclusions are of great interest. Madras shows the greatest and most uniform incidence of smallpox, and is the only province which does not receive much rain during the southwest monsoon months. In all of the seven provinces which receive heavy rains at that period, there is a remarkable decline in smallpox every year at that period, followed by an increase during the succeeding cold and hot, dry seasons. The next monsoon brings about again a decline but in Madras this decline is not observed. The great incidence of smallpox occurs there after the heavy rains of November and December.

The greatest epidemics occur in Northwest India, the Central India and Deccan plateau, where there is a low rainfall, and outbreaks are least marked in humid Bengal which has a consistently high rainfall. The failure of the southwest monsoon rains, with accompanying comparatively low humidity, is almost invariably followed by epidemics in the Northwest and Central areas. In the damp areas of Lower Bengal, Assam and Madras, there is no apparent relation of smallpox to either the monthly temperature or relative humidity. The absolute humidity (the amount of aqueous vapor measured by its pressure, a convenient measure of combined humidity and temperature) shows a close relation to the prevalence of smallpox. This absolute humidity reaches its maximum with the annual decline of smallpox during the southwest monsoon in every province which receives its main rain at that time. In Madras both the absolute humidity and the smallpox rate are stationary at that season in the absence of the southwest monsoon. The maximum absolute humidity occurs in April and May and is accompanied by the annual moderate decline of smallpox. The influence of high absolute humidity in checking smallpox explains the seasonal prevalence in all parts of India with their varying rainfalls and temperatures. The rainfall alone does not explain the great lessening in smallpox during the southwest monsoon.

The records of the Indian jails for thirty years show a very close relationship between humidity and smallpox for the whole of North and Central India, the relation being inverse.

An examination of the yearly variations of smallpox mortality as compared with the rainfall records covering forty-eight years, and of the absolute humidity for thirty years, and of the smallpox rates and the absolute humidity during the monsoon and autumn for thirty years, confirms these general findings with slight exceptions. In the less rainy areas of Northwest and Central India, low absolute humidity during the monsoon is almost always followed by a high

smallpox incidence during the dry seasons. One exception is that low humidity seen after an epidemic which has exhausted most of the susceptible material may not show the usual increase, while several consecutive years of normal or high absolute humidity may be followed by a rise, owing to the accumulation of susceptible persons.

The manner in which high absolute humidity reduces smallpox is a matter of interesting speculation. The germ of smallpox is unknown, but the recent work of Gordon[2] has apparently demonstrated that the virus is particulate and can be thrown down by gravity. Just how the prevalence of humid winds combined with high temperature prevents the survival and dissemination of the germs is not known. Sir Leonard Rogers is inclined to believe that in some way they act upon the organism after it escapes from the patient and during its passage to the next victim. This belief presupposes that the infection is aerial, which has been held by many over a long period of time. There is abundant food for thought in this study, and the methods employed may eventually greatly influence epidemiological researches.

1. *Smallpox and Climate in India, Forecasting of Epidemics.* By Sir Leonard Rogers, London: Published by His Majesty's Stationery Office.
2. *Medical Research Council, Special Report Series No. 98.*

VICTOR CLARENCE VAUGHAN

THE TWENTY-SEVENTH of October will be the seventy-fifth anniversary of the birth of Dr. Victor C. Vaughan, and it is no more than fitting that this JOURNAL should pay a tribute to a man who throughout his entire professional life has been an exponent of public health, who has been a pioneer in many lines and who has added much to our knowledge.

Dr. Vaughan was born at Mt. Airy, Randolph County, Missouri. His preliminary education was obtained at Mt. Pleasant College, Mo. From the University of Michigan, he received four successive degrees: M.S. in 1875, Ph.D. in 1876, M.D. in 1878 and LL.D. in 1900. He began his teaching career in the University of Michigan as assistant in the chemistry laboratory in 1875, and was appointed assistant professor of medical chemistry in 1880. He became professor of physiological and pathological chemistry and associate professor in therapeutics and materia medica in 1883. In 1887 he was made professor of hygiene and physiological chemistry and director of the hygienic laboratory, in 1891 became Dean of the Medical School, a position which he held until 1921.

He entered the U. S. Army in 1898, taking part in the Santiago campaign as Major and Surgeon of the 33d Michigan Volunteers, later becoming Division Surgeon. In 1917 he was appointed Colonel in the Medical Corps of the army and put in charge of the Division of Communicable Diseases.

Dr. Vaughan has held many positions of honor, and has been President of the Association of American Physicians and of the American Medical Association. He is a member of numerous societies, including the National Academy of Sciences and the American Philosophical Society in this country, and the French and Hungarian Societies of Hygiene in foreign countries. He is also a Knight in the Legion of Honor of France.

While Dr. Vaughan has made notable contributions along many lines, he is

probably best known for his work on the Typhoid Fever Commission during the Spanish-American War. He is the sole survivor of that Commission. It will be remembered that for the first time the agency of flies in the spread of typhoid fever was made clear, a discovery which has aided greatly in our control of this disease. He was also a pioneer in the study of milk as an agency in spreading certain diseases, and was the first to give an adequate explanation of the phenomenon of anaphylaxis.

Throughout his life Dr. Vaughan has been known as a great teacher, and thousands of physicians and sanitarians throughout our country gladly attest to his ability in this line. His teaching was always combined with a vast amount of laboratory work. He was the first to cultivate bacteria in enormous quantities, which he did in making one of his most notable studies—on the split proteins. He has always been a producer, original in his ideas as well as in his methods. In debate he is always sure of his ground and incisive in his argument. He has never palavered nor catered to the opposition. Genial in manner and with a multitude of anecdotes at hand, he is a delightful companion and an excellent raconteur.

He gave up his position as Dean at the University of Michigan in 1921, and since then has spent most of his time in Washington as chairman of the Division of Medical Sciences, National Research Council.

Unfortunately for his friends, Dr. Vaughan is absent in the Far East, so that for the present, all we can do is to pay this inadequate but sincere tribute to his accomplishments and personality, and to wish for him many more years of happiness and health.

A WELCOME PUBLICATION

IN JUNE, 1925, Dr. Huang, Chief, Department of Administration at Peking, sent a circular letter to medical leaders in eighteen provinces and Manchuria whose addresses were available, asking them to supply monthly reports of the prevalence of the major communicable diseases. The response was gratifying, and we have just received from Dr. Huang the monthly reports from May, 1925, to April, 1926.[1] The diseases to be reported have been selected on the basis of requirements of the Eastern Bureau of the League of Nations Health Organization. It is pointed out that there is a great lack of modern means of communication in China, so that it takes from two to three months to obtain reports from the interior and distant provinces. The reports are well done, Chinese and English being used. Unfortunately, exact numbers of cases and deaths are not given, but the relative prevalence of the diseases is indicated by cross marks, from one to three, three crosses meaning that a disease exists in epidemic form.

Dr. Huang was responsible for this excellent forward step. He quotes Sir Arthur Newsholme as saying that the publication of the morbidity and mortality reports in England since 1834 "has been a chief driving power of public health progress" in that country. He foresees a similar result for China.

We welcome the new publication and congratulate Dr. Huang upon his enterprise and the excellent way in which it is being conducted.

1. *National Epidemic Prevention Bureau*, Peking, China; Tsefang F. Huang, M.D., Chief, Dept. Administration.

ASSOCIATION NEWS

NOTES ON THE ANNUAL MEETING

MOTION PICTURES

On Monday, Wednesday and Thursday during the Annual Meeting, there will be a showing of health motion pictures from 5 to 6 P.M. These films have been selected from among the best available and a representative of the National Health Council by whose courtesy this program is arranged will be present to give information about obtaining the pictures for local use. Among the pictures that will be shown at Buffalo are the following:

The Health Twins at Work, Working for Dear Life (Health examinations), *He Who Laughs Last* (Health examinations), *The Hungry Dragon* (Health education for children), *New Ways for Old* (Diphtheria prevention), *Rickets* (a new film), *Malaria* (a new film), Over *Weight, Diphtheria, Antitoxin, Flies, Breast vs. Bottle Fed* (trailers).

SCHOOL MEDICAL INSPECTORS

An informal dinner and conference for School Medical Inspectors will be held on Wednesday evening, October 13. This meeting is being arranged by Dr. William A. Howe, State Medical Inspector of Schools. All school medical inspectors are invited to attend. Many problems will be discussed but there will be no formal papers.

ENGINEERS' MEETING

The Buffalo Section of the American Society of Civil Engineers will hold a meeting on Wednesday, October 13, with a program of special interest to public health engineers. Following the meeting there will be a trip to places of engineering interest.

STATE MEDICAL SOCIETY

The Eighth District Branch of the Medical Society of the State of New York will hold its Annual Meeting on Wednesday, October 13.

HEADQUARTERS AND INFORMATION

Final and accurate information about the Annual Meeting of the Association may be obtained at the Information Desk at the Hotel Statler. Programs and ballots will be distributed upon registration. The registration and information desk will be located on the mezzanine floor. Registration will begin at 2 P.M. Sunday, October 10, and will continue from 8 A.M. to 6 P.M. each day of the meeting. Morning sessions begin at 9:30, so early registration is advised.

EXHIBITS

A thorough knowledge and appreciation of the apparatus and products used in his profession should be part of the armamentarium of the sanitarian. He should buy his equipment, his tools, his laboratory impedimenta from approved houses whose guarantee is gilt-edged. He should remember that his recommendation of a food, or of a pharmaceutical may influence many people to buy whose health he is paid to protect, and that recommendation should not be given lightly.

The annual exhibit of the Association brings before the public health profession the names and merchandise of reputable concerns. The exhibit space is carefully allotted and contracts accepted only from companies whose practices

and products meet the Association's high standard. Delegates may buy and recommend, therefore, without hesitation the exhibited articles. Every visitor is invited and urged to inspect the exhibits. New apparatus, new foods, new methods, new supplies are being constantly offered for sale. Improvements are being made continually in the old and familiar wares. The Buffalo exhibits show simply and completely some of the best.

This year the exhibits are displayed in two rooms. There are sixteen booths in the Ball Room Foyer on the main floor and twenty-two in the Chinese Room on the mezzanine. In addition to the commercial exhibits, there will be a larger number than usual of educational displays. Among them will be exhibits from the New York State Department of Health, the State Committee on Tuberculosis and Public Health of the New York State Charities Aid, the Association for Medical Progress, the National Organization for Public Health Nursing, and the American Heart Association.

The list of commercial exhibitors and a description of their exhibits follow:

BALL ROOM FOYER

KELLOGG COMPANY, BATTLE CREEK, MICH., Booth No. 1.

A demonstration of All-Bran muffins and New Oata.

METROPOLITAN LIFE INSURANCE COMPANY, NEW YORK, N. Y. Booth No. 2.

A visual representation, in novel form, of the various avenues of health education which reach into the home. Its slogan is, "Every Home a Health Center." The exhibit will be available as a loan, free except for transportation charges, to any organization.

NATIONAL CHILD WELFARE ASSOCIATION, NEW YORK, N. Y. Booth No. 3.

An exhibit of health posters, reproductions of original drawings, attractively hand-colored on strong cover paper. The illustrations are supplemented by large-sized text which is concise, forceful and suggestive. The posters are 17 x 28 inches in size and may be eyeleted for hanging.

LAMOTTE CHEMICAL PRODUCTS COMPANY, BALTIMORE, MD. Booth No. 4.

Materials and equipment for hydrogen ion concentration.

THE CHAS. H. PHILLIPS CHEMICAL COMPANY, NEW YORK AND LONDON. Booth No. 5.

Phillips' Milk of Magnesia; Phillips' Dental Magnesia, A Superior Tooth Paste; Phillips' Phospho-Muriate of Quinine Compound, a non-alcoholic tonic.

THE J. B. FORD COMPANY, WYANDOTTE, MICH. Booth No. 6.

Wyandotte Yellow Hoop for washing clothes in steam laundries; Wyandotte Cleaner and Cleanser for washing dishes and general cleaning in the kitchen; Wyandotte Detergent for abrasive cleaning such as marble, tile, mosaic, painted surfaces, etc.

POSTUM CEREAL COMPANY, INC., NEW YORK, N. Y. Booth No. 7.

An exhibit by the Educational Department of charts, posters, and booklets suitable for supplementary teaching materials in schools, clinics and health centers. Free copies are available for all delegates.

HORLICK'S MALTED MILK CORPORATION. RACINE, WIS. Booth No. 8.

The story of Horlick's Malted Milk will be told and illustrated and an interesting sight-seeing tour through the great laboratories and plants at Racine, Wisconsin, and a visit to the dairies and grain fields which produce the materials from which this universally used food product is made, will be provided. The story of Horlick's Malted Milk and its penetration to the four corners of the earth is one of the romances of American business. Visitors will learn by eye and ear the intricacies of manufacture and some of the achievements of the original. It is rumored that they may also be given an opportunity to taste the product.

THE BORDEN COMPANY, NEW YORK, N. Y. Booth No. 9.

Eagle Brand Condensed Milk will be displayed and its use as a supplementary food in overcoming malnutrition will be featured. Pictures of a model farm and condensary prepared by this company for the Smithsonian Institute will be exhibited.

NATIONAL DAIRY COUNCIL, CHICAGO, ILL. Booth No. 10.

The exhibit will be a unit designed to emphasize the central, fundamental place

dairy products have held in the health and development of the race. It will be composed of an interior of a schoolroom as the central figure, with cutout figures of teacher and children. The background is six or eight movable panels illustrating the eight health rules. On either side of the schoolroom there are large panels with a statement concerning the importance of milk and the proper care of milk in its distribution to-day.

CHEMICAL TOILET CORPORATION, SYRACUSE, N. Y. Booth No. 11.

Sewage disposal equipment.

CONTINENTAL SCALE WORKS, CHICAGO, ILL. Booth No. 12.

Personal weighing scales for schools, clinics, traveling nurses, etc.

GENERAL LABORATORIES, MADISON, WIS. Booth No. 13.

B-K (a concentrated Sodium Hypochlorite) sterilizer, deodorant and disinfectant for use in dairies, milk plants, restaurants, soda fountains, schools, hotels, hospitals, homes, etc. Non-poisonous, clean, colorless.

WALLACE & TIERNAN COMPANY, NEWARK, N. J. Booths Nos. 14, 15, 16.

An entirely new line of Chlorine Control Apparatus will be shown for water sterilization, sewage disinfection, swimming pool sanitation, removal of obnoxious odors, etc. These new chlorinators are the result of five years' experimentation and research based on the knowledge gained by the W&T staff in making nearly 8,000 installations of Chlorine Control Apparatus in the last fourteen years.

A new compensator solution feed type (Type MSP), the new W&T Chloro-Clock, and the novel W&T Chloro-Scale will be shown.

The most important new W&T development is an Automatic Vacuum Type Chlorinator which automatically proportions the flow of chlorine to the flow of water.

CHINESE ROOM

SPENCER LENS COMPANY, BUFFALO, N. Y. Booth No. 1.

Microscopes, projection apparatus, microtomes, scientific supplies.

CENTRAL CITY CHEMICAL COMPANY, CHICAGO, ILL. Booth No. 2.

"Forma-Germkill Formaldehyde Fumigators" for health departments, hospitals and school boards. An efficient, convenient, and economical method for fumigation. Bacteriological tests made by the Pease Laboratories, New York City, show that the solidified formaldehyde product contained in "Forma-Germkill Fumigators" is effective on the basis of one ounce solidified formaldehyde per 1,000 cubic feet of air space to be fumigated. They are manufactured in six different capacities of from 1,000 to 5,000 cubic feet.

Over 30,000 "Forma-Germkill Fumigators" have been used by the Health Department at Washington, D. C., during the past four years.

BRUCK'S NURSES OUTFITTING COMPANY, NEW YORK, N. Y. Booth No. 7.

A complete line of public health uniforms, capes, coats and hats, in all colors and styles, collars, cuffs and all accessories, by a firm that outfits many of the foremost institutions in the United States and Canada. "If it is a Uniform, Bruck's makes it."

THE GILLILAND LABORATORIES, MARIETTA, PA. Booth No. 8.

A complete line of biological products. This firm gives special attention to supplying biological products to state, city and county boards of health and the representative in charge will be pleased to answer any inquiries. They extend a cordial invitation to all members to visit their Booth.

GRADWOHL LABORATORIES, ST. LOUIS, MO. Booth No. 9.

The Pasteur Institute of St. Louis. A laboratory of national standing will present a new line of dehydrated culture media especially designed for public health officials.

DETROIT PUBLISHING COMPANY, DETROIT, MICH. Booth No. 10.

Visual education aids for health teaching in the form of the Barns Health Cartoons compose this exhibit. This material, in both slides and prints, is a teaching device for the use of health specialists and teachers of health, physiology and hygiene. The subjects taken up are food and nutrition, growth,

teeth, exercise, disease and happiness. This material will be exhibited with Bausch & Lomb projectors.

HOSPITAL SOCIAL SERVICE ASSOCIATION, NEW YORK, N. Y. Booth No. 12.

A magazine devoted to the interest of Hospital Social Service.

BUFFALO FORGE COMPANY, BUFFALO, N. Y. Booth No. 14.

Ventilating fans, Carrier air washers, Carrier dewpoint system of humidity control will be shown by means of bulletins, photographs and charts. This apparatus maintains and controls air conditions in densely peopled spaces to any desired requirement of humidity or temperature. The firm's engineers will be glad to discuss the possibility of mechanical ventilation with visitors.

STANDARD OIL COMPANY OF NEW JERSEY, CHEMICAL PRODUCTS DIVISION. Booth No. 17.

Nujol, Cream of Nujol and Mistol will be displayed. Nujol is a plain, lubricating mineral oil whose particular purpose is the correction of constipation of whatever form. Cream of Nujol is a milk-white emulsion of a palatability that commends it to all patients, young and old, with any aversion to oil. Mistol is an antiseptic which gives soothing relief in all inflamed conditions of the nose and throat, including acute paroxysms of asthma and hay fever.

DELCO LIGHT COMPANY, DAYTON, O. Booths Nos. 18 and 19.

Frigidaire—electric refrigeration.

MALTOP, INC., BUFFALO, N. Y. Booth No. 20.

A display of Toddy, "A Meal in a Glass." Toddy provides every body-building essential in a form that is entirely and quickly assimilated. It is widely used in convalescence, malnutrition, sleeplessness, etc., but it is not a medicine. Toddy is a delicious and healthful food drink for everybody, everyday. Its base is malt extract and doctors recommend it because of its food value and easy digestibility.

BOOKS

The fifth Annual Book Exhibit will include many new titles. The number of public health books is increasing so rapidly that it will be necessary this year to confine the exhibit largely to the newer books. Reproductions of the new chart of the Association, "Milestones of Public Health Progress in the United States," will be on display. These have been made from the chart which created so much favorable comment at the American Health Congress at Atlantic City.

LIST OF NEW MEMBERS

Col. William J. Bacon, Memphis, Tenn., Commissioner of Public Health of Shelby County

Laura Bauch, R.N., Lansing, Mich., Director of Clinics, Michigan Tuberculosis Association

William Marion Bevis, M.D., Bartow, Fla., County Health Officer

Luther M. Boyers, A.B., M.D., Berkeley, Calif., Study of Tropical Infections

Benjamin L. Burdette, M.D., Shelbyville, Tenn. (Assoc.)

Ernest W. Cavaness, M.D., Kansas City, Mo., Director of Health

LeVerne H. Clouser, B.S., State College, Pa., Instructor in Sanitary Engineering

Theresa B. Collette, R.N., San Fernando, Calif., Supervising Public Health Nurse

Lacy W. Corbett, M.D., Goldsboro, N. C., Superintendent of Health

Hazel Corbin, New York, N. Y., General Director, Maternity Center Association

Seth L. Cox, A.B., M.D., Topeka, Kans., Medical Director, Kansas State Tuberculosis Association

Anthony S. Culkowski, M.D., Lackawanna, N. Y., Health Officer

Thomas F. Davies, M.D., Hempstead, N. Y., Health Officer

Thomas J. Duffield, B.S., New York, N. Y., Executive Secretary, New York State Commission on Ventilation

Alfred T. Eide, M.D., Haines City, Fla., Commissioner of Health

Antonio G. Gonzaga, M.D., Rio de Janeiro, Brazil, Public Health Official (Assoc.)

Bernard H. Jeup, B.S., Cincinnati, O., Technical Assistant in Sanitary Engineering, U. S. P. H. S.

Daniel S. Latham, M.D., Cranston, R. I., Superintendent of Health, City Physician and Milk Inspector

William Litterer, B.S., A.M., M.D., Nashville, Tenn., Director of Laboratories, State Department of Public Health

Carl A. Mitchell, M.D., Benton Harbor, Mich., Director of Public Health

Margaret R. Morrison, B.A., M.A., Chattanooga, Tenn., Bacteriologist, City Department of Health

Mary S. Routzahn, B.A., New York, N. Y., Publicity Methods in Social and Public Health Work

Louis C. Rufe, Doylestown, Pa., State Health Officer

George C. Robertson, B.A., Buenos Aires, Argentina (Formerly with Sanitary Corps, U. S. A.)

Theophilus Schmid, Jr., B.S., Chicago, Ill., Junior Sanitary Engineer, Division of Water Safety Control

J. E. W. Sheehan, Memphis, Tenn., City Smoke Marshal
Charles R. Skinner, B.S., M.D., Hudson, N. Y., Health Officer
Beatrice A. Smith, B.S., M.D., Buffalo, N. Y., Bacteriologist, Niagara Falls Public Health Laboratory
Mrs. Belle M. Wagner, Tampa, Fla., Director, Nursing Department, Department of Health
Clarence J. Ward, Kingwood, W. Va., Sanitary Inspector and Instructor with the Preston County Health Unit
Solomon Weingrad, M.D., Mountaindale, N. Y., Health Officer
Ella G. White, Austin, Tex., Secretary, Division of Sanitary Engineering, State Health Department
Jesse F. Williams, A.B., M.D., New York, N. Y., Professor of Physical Education, Teachers College, Columbia University
Virginia R. Wing, Cleveland, O., Director, Health Education, Cleveland Health Council
C. L. Woolard, D.V.M., Tampa, Fla., Chief Dairy Inspector

DECEASED MEMBERS AND FELLOWS

Dr. William Charles Laidlaw, 52, deputy minister of public health for the Province of Alberta, Canada, died suddenly of heart failure at his home in Edmonton, Alberta, August 15. Dr. Laidlaw had many friends in the Association, having been elected a member in 1916 and a Fellow in 1923.

Dr. Laidlaw was born in Stayner, Ontario. He was educated at Upper Canada College and the University of Toronto, where he received his medical degree. For many years Dr. Laidlaw was active in public health work. In 1912 he was appointed provincial medical health officer but his service was interrupted by duty overseas at the outbreak of the war in 1914. Upon his return he resumed his public health responsibilities and in 1921 was made deputy minister of public health. He was a veteran of the South African War and served as medical officer of the Fourth Brigade in France, later being transferred to headquarters staff of the Canadian corps, as sanitary inspector officer.

H. V. Amerman, health officer, Kearny, N. J., elected a member October, 1917.

J. R. Harris, M.D., Bureau of Health, Niagara Falls, N. Y., elected a member November, 1920.

BOOKS RECEIVED DURING SEPTEMBER, 1926

A GUIDE FOR DIABETICS. By Walter R. Campbell and Mame T. Porter. Baltimore: Williams & Wilkins, 1926. 259 pp. Price, $2.50.

TUBERCULOSIS SURVEY OF BOSTON, 1925. By Murray P. Horwood, Ph.D. Boston: Boston Tuberculosis Association. 1926. 215 pp.

GUERIR EST BIEN PREVENIR EST MIEUX. By Louis Spillman and Jacques Parisot. Paris: Berger-Levrault, Editeurs, 1925. 293 pp. Price, 25 fr.

DELUSION AND BELIEF. By C. Macfie Campbell. Cambridge: Harvard University Press, 1926. 79 pp. Price, $1.50.

THE PRACTICE OF PHYSIOTHERAPY. By C. M. Sampson, M.D. St. Louis: Mosby, 1926. 620 pp. Price, $10.00.

SURGICAL TREATMENT OF GOITER. By William Bartlett, M.D. St. Louis: Mosby, 1926. 365 pp. Price, $8.50.

ESSAYS IN THE HISTORY OF MEDICINE. By Karl Sudhoff, M.D. Edited by Fielding H. Garrison, M.D. New York: Medical Life Press, 1926. 397 pp. Price, $5.00.

SEX AND THE YOUNG. By Marie Carmichael Stopes. New York: Putnam, 1926. 248 pp. Price, $2.00.

THE PROBLEMS OF CHILDHOOD. By Angelo Patri. New York: Appleton, 1926. 309 pp. Price, $2.00.

RHEUMATISM: ITS MEANING AND ITS MENACE. By Lewellys F. Barker, M.D., and Norman B. Cole, M.D. New York: Appleton, 1926. 166 pp. Price, $1.50.

OUR DOCTORS. A Novel of Today. By Maurice Duplay. Translation and preface by Joseph Collins. Harpers, 1926. 279 pp. Price, $2.00.

AN INTRODUCION TO SURFACE CHEMISTRY. By E. K. Rideal. London: Cambridge University Press (Macmillan Distributors), 1926. 336 pp. Price, $5.50.

THE GENUS AMBLYOMMA. By L. E. Robinson. London: Cambridge University Press (Macmillan Distributors), 1926. 302 pp. Price, $1.00.

OUTWITTING MIDDLE AGE. By Dr. Carl Ramus. New York: Century Co., 1926. 269 pp. Price, $2.00.

BOOKS AND REPORTS

The Meaning of Psychology—*By C. K. Ogden. New York: Harpers,* 1926. 326 pp. Price, $3.00.

At first glance one suspects that this book was written for the layman. The author starts out in semi-popular style to discuss "the four and a half good reasons for studying psychology seriously." Psychology should throw light on the following subjects:

1. What we are.
2. Why we go wrong.
3. How we can be improved.
4. The study of other subjects

And finally, for the "half point," psychology should aid in the interpretation of life and happiness.

One does not need to go far beyond the "preliminary" to suspect that Dr. Ogden's sound scientific training and rich background and knowledge of psychological literature would prove too much for the popular style. Soon he throws off the mantle of the layman and, though his style is clear and easily read, he jumps directly into the midst of controversial fields of modern psychology. The theories of the mind-body relationship are discussed with reasons for and against each theory. The points of view of the various schools of psychology are examined and the newest school of all, that of the so-called "gestalt psychologists," clearly presented.

The treatment of the various schools of thought is most fair. Each has been given the credit which it deserves. The author is obviously championing the new German theory. Undoubtedly, the chapter which will prove most interesting to the layman and to those non-professionals with fair amount of background, is the one in which Köhler's experimentations on apes are cited and described in order to clarify the "gestalt" idea.

To a student who has a fair foundation in modern psychology, the book is an excellent aid in bridging over the seeming contradictions of the various points of view and defining that undefinable word "gestalt." To a layman who is not familiar with the many controversies waged in the field of the youngest of the sciences, the treatment of the fundamentals is too sketchy, and the assumption on the part of the author that his reader will be able to leap with him across precipices is a dubious one. More diagrams and specific examples would have been welcome. The greatest contribution of the book is the interpretation of the standard subject matter of psychology in terms of the "gestalt" theory.

On the whole the book is very readable and full of meaty material well presented. But the book is not for beginners, as the advertising cover declares. One needs to be at least somewhat familiar with the general field of psychology in order to appreciate how well the author has handled his subject matter, and to fill in the gaps left for one's imagination. The beginner would find himself at the close of the book still puzzled over the answer to the four and a half questions. SADIE MYERS SHELLOW

Our Times. The Turn of the Century—*By Mark Sullivan. New York: Scribner,* 1926. 610 pp. Price, $5.00.

It is indeed refreshing to find such an excellent grasp of public health in a book which reviews in a broad way the historical aspect of social, political and economic development in the United States during the past twenty-five years. This book commends itself to public health workers because of the remarkable grasp of the writer of the results on the population of the United States of the changing habits of life and the development of transportation, as well as our political and social unrest. The description of the American willingness to dismiss the old and try the new, which accounts for the rapid development of personal hygiene and sanitation as compared to other nations, is especially noteworthy.

Those who have been searching for accessory factors in the reduction of many diseases will find this volume extremely interesting as a source book. It also helps to interpret many of the phenomena so puzzling in analyzing biological and vital statistical data during this quarter of a century. The chapter on the progress of sanitation is well done. The bril-

liant achievements of Major William Crawford Gorgas and his associates are interesting and accurately portrayed.

The manner of presentation of facts makes an appeal to the imagination, yet enough actual details and figures are given to make the book valuable to students and teachers of public health and to professional sanitarians. The use of diagrams, pictures and cartoons adds to the historical interest as well as offering considerable amusement.

It is seldom that we find anyone with the ability to interpret so clearly the American temperament, and to detail the influences at work—with their results—so vividly. Mark Sullivan has made history read like a novel.

J. L. POMEROY.

Children, the Magazine for Parents—*New York: Parents' Publishing Association, Inc., 353 Fourth Ave., New York City.* Price $.25 single copy.

With the appearance of the first issue this month of *Children, the Magazine for Parents*, a new type of educational journal is offered. In the introductory article by George J. Hecht, publisher, the purpose of the magazine is outlined, "We consider human beings to be children until they 'come of age' at twenty-one. We will, therefore, consider their problems from the crib through college. There are three principal phases of their existence: physical, mental, and spiritual. Under these heads we shall consider all matters of health, education, vocations, recreations, as well as character building and personality."

The board of editors represents eminent specialists in the fields of education, child study, behavior and educational psychology, mental hygiene, euthenics, health education, nutrition, vocational training and recreation.

Usually, a magazine for parents stresses only the problems of motherhood, but a commendable feature of this new monthly publication is the department devoted to fathers and the first issue carries "Inside Tips for Fathers" by Professor Ernest R. Groves, Professor of Sociology, Boston University. Among the articles in this initial issue are: "Preparing the Child for School," Dr. Helen T. Woolley; "History, the Truth and the Child," Hendrik Willem van Loon; "What Is a Conditioned Reflex," Dr. John B. Watson; "Shall Jack Play Football?" Arthur P. Forbush; "How Much Are Parents to Blame? A Symposium."

Contributions to the nutrition section have been made by the Department of Nutrition, Teachers College, Columbia University. The Playground and Recreation Association of America is responsible for the department entitled "Constructive Fun."

Another valuable feature is the Parents' Forum and study section for the benefit of mothers' clubs, parent-teacher groups, etc.

There is need for such a publication and the policy of this magazine promises to treat the problems of parents and their children sanely and intelligently. A. B. T.

The National Government and Public Health—A 425 page book, *The National Government and Public Health*, was issued on August 1 by the Institute for Government Research, 26 Jackson Place, Washington, D. C. This book is divided into three parts, the first considering the philosophy of the relationship of government and health, the second presenting in detail the health activities of some forty administrative units of the national government, and the third part giving a practical plan for the more effective coördination of these now scattered activities. The Institute also has in preparation a monograph on the Medical Department of the Army. Its other publications of interest to sanitarians include monographs on the U. S. Public Health Service and the Children's Bureau. Any of these useful books may be obtained through the Book Department of the A. P. H. A. J. A. T.

Sex Education—*By Philip Zenner, M.D. New York: Appleton*, 1926. 134 pp. Price, $1.50.

As originally printed in 1910, this little volume was undoubtedly a worthwhile pathfinder in the field of education in sexual physiology and hygiene.

The talks, of which the book is mainly composed, were at the time originally given, valuable illustrations of what a physician could do in awakening interest on the part of the public and in stimulating his colleagues to do likewise. It does seem, however, that with the progress which has been made something more than this could be printed if more printed material is needed.

There can be no criticism of the content of the book unless it be lack of depth.

One feels that he is reading the courageous writings of the pioneer, and not the instructions of a teacher of to-day ALEC N. THOMSON

The Fifth Annual Canadian Conference on Child Welfare—*Published at the request of the Canadian Council of Child Welfare by the Department of Labor, Canada. Ottawa:* 1925. 290 pp.

An adequate review of the report of the Fifth Annual Canadian Conference on Child Welfare would be impossible if for no other reason than that of space. The report is full of good things. It is so complete in detail about subjects affecting child welfare that it practically constitutes a text book.

The main topics presented were: Problems of Child Health; Tuberculosis and Child Welfare; Social Hygiene and Child Welfare; Mental Hygiene and Child Welfare; Child Neglect and Dependency; Juvenile Immigration; Family Desertion; and Delinquency. Ethical and Spiritual Development of the Child; Essentials in Child Welfare Program, and a Conference of the French-Speaking Section.

The organizations represented were classified into national, provincial and municipal and there were also individual representations.

Perhaps the best idea of the scope and aims of the Conference will be given by quoting one of the numerous objectives for 1925 to 1930, namely, that on Health:

"A—On Health

"1. Support of the movement toward the establishment of a Federal Ministry of Health which shall assume responsibility for general research in preventive medicine and coöperation with provincial health bodies in the dissemination of health literature and in providing specialized clinics.

"2. Support of effort in each province toward setting up a Provincial Department or Bureau of Health which will either provide or coöperate with municipalities in providing, in addition to facilities for sanitation and disease control, the following clinical service:

"a. For prenatal and preschool guidance.

"b. For physical and mental examination of all school children not less than three times during their school career and on making application for work permits.

"c. For special physical and psychiatric service to problem cases—both children and adults.

"3. Encouragement of research in Canadian universities and colleges on matters affecting the health and well-being of children."

This report is a readable one from the point of view of the busy health worker because it so thoughtfully places before him what it has to say in a well classified form.

MERRILL E. CHAMPION

Facts on the Heart—*By Richard C. Cabot, M.D. Philadelphia and London: Saunders,* 1926. 781 pp., 163 ill. Price, $7.50.

This book is the result of the careful study of 4,143 cardiac lesions found in 1,906 autopsies, in which the clinical records have been carefully examined and compared with the post-mortem findings. The autopsies were made by Dr. James H. Wright and Oscar Richardson, though the patients were cared for by a number of physicians. These records have been studied, abstracted and edited by Dr. Cabot. The book thus represents an enormous amount of careful fact finding work. The increased interest which has been shown in recent years in heart disease, as manifested by the formation of the American Heart Association in 1924, and the possibility of preventing many of these cases and improving the condition of others, makes this book particularly timely. The editor recognizes that the book is not one to be read through, and advises the average reader to study the opening and closing chapters and the summary at the end of each section, using the large number of illustrative cases which are given as one may be inclined. It is a record of facts and from this standpoint there seems to be nothing to criticise. The book is valuable for this feature, and for the aid it will give in diagnosis by coördinating the clinical symptoms with the actual lesions.

Nothing is said about prevention, but when we learn that more than 90 per cent of true disease of the heart is rheumatic, syphilitic and hypertensive, one can readily see the wide field for the prevention of such cases. The rheumatic type comes in early youth, the syphilitic in middle life, and the hypertensive after the fiftieth year. As the first two of these are certainly parasitic diseases, the methods of prevention are more or less obvious. The cause of the third type is still much under discussion, but there is no question that much can be done in the way of prevention by correct living.

The book is one that can be recommended to the practitioner and student of the heart, but there is little in it of practical value to the general class of our readers. It is a tremendous piece of work, requiring time, patience and the critical faculty.

M. P. RAVENEL

Birth Control and the State. A Plea and a Forecast—*By C. P. Blacker, M.C., M.R.C.S., L.R.C.P. New York: Dutton,* 1926. 87 pp. Price, $1.00.

Written from the English standpoint and with the avowed intention of making an appeal to the medical profession particularly, but also to the general public, in order to overcome opposition such as was expressed to the petition presented in 1924 to the Minister of Health, this book is an admirable presentation of facts concerning the subject, which is a very live question in England and which is gaining prominent adherents very rapidly in this country. It is written in positive language and the author is strongly in favor of birth control, holding views for its effect on the future which seem to us over optimistic, though he distinctly disclaims any Utopian ideas.

Unfortunately for his argument—though it proves his honesty intellectually as well as otherwise—he admits that up to the present time no satisfactory contraceptive exists. To us this seems to kill many of his arguments, though it seems fair and reasonable that education on the subject should be allowed. We hold with him entirely in his stand that the medical profession should be the one to take the initiative and do the teaching.

The book is interestingly written and can be recommended to all those interested in this subject. M. P. RAVENEL

Diseases of the Skin—*By Richard L. Sutton, M.D., LL.D., F.R.S. (Edin.). (6th ed. rev.) St. Louis: Mosby,* 1926. 1,303 pp. Price, $12.00.

When a book reaches its sixth edition in the tenth year of life, it is evidence that it has met a demand and fulfilled a mission in an acceptable way. Successive editions of the work of Dr. Sutton have received favorable comment. The sixth edition is no exception to the rule which this book has established. There is little in it to criticise, even though a reviewer may see room here and there for differences of opinion. We believe, for example, that insufficient importance has been accorded to the work of Goldberger on pellagra, and that there is no valid reason for the repetition of the statement concerning the eating of diseased or fermented maize as a causative factor. The author takes no stand in regard to the identity of alastrim and smallpox, which we regret, and does not quote the latest evidence showing the identity of the two diseases, which is now generally accepted.

In writing of malignant pustule we believe the author would have done well to have gone more fully into the experience of our army during the World War, and the careful studies made of the disease in the city of New York. We believe he should also have mentioned that Eichhorn—who can hardly be regarded as "a pioneer in the use of the serum"—has succeeded in producing a serum very much stronger than that of Sclavo by the use of spore vaccine. The selection of the proper serum is of great importance.

The book is profusely illustrated, containing 1,147 illustrations and 11 colored plates, all of which are good, and many of which are more than usually good. The student and diagnostician will find the multiple illustrations particularly useful, the author not being content with a single illustration of a particular lesion, but giving as many as six or seven showing the various forms which it may assume.

The book is encyclopedic in character, clearly written in easy style. Each section is followed by an abundant bibliography which as a rule is well up to date. Altogether it is safe to say that there is no single volume on diseases of the skin which will so well meet the requirements of the average practitioner and health officer.

M. P. RAVENEL

Nursery Guide for Mothers and Children's Nurses—*By Louis W. Sauer, Ph.D., M.D. (2d ed. rev.) St. Louis: Mosby,* 1926. 206 pp. Price, $2.00.

This is an attractive, well illustrated book. The statements are generally clear but brief and concise. The title of most paragraphs stands out clearly in the margin making it convenient for reference.

The first five chapters are devoted to a discussion of the care and feeding of infants similar to that found in many baby books. The two remaining chapters briefly discuss the common ailments of infancy and the nursing care of the sick infant—viz., how to take temperatures, give enemas and what to do until the doctor comes.

The nurse and mother will find its charts, diets, directions for preparing food, and caring for the infant simple and useful.

The new edition has been brought up to date, contains more charts and illustrations and has added a diet list for the child who is over three years of age. HELEN A. MOORE

HEALTH DEPARTMENT REPORTS

IRA V. HISCOCK

Pittsfield, Mass.—Bound in grey covers, with an attractive and well balanced front cover and printed in clear type, the 1925 Pittsfield report of 28 pages has been carefully prepared. The health officer has departed from the usual practice in his report and has utilized the Appraisal Form suggested by the Committee on Administrative Health Practice of the American Public Health Association for the purpose of evaluating health practice in this community of 46,877 people.

The crude death rate for the year was the lowest on record (11.3), the campaign against tuberculosis was continued with a decreased incidence of the disease, while an infant mortality rate of 53 was recorded. All milk is either pasteurized or from tuberculin tested cattle.

Maine Public Health Association—The report of the 1925 activities of the Maine Public Health Association is published in a somewhat unique form under the title *Working for Health*. The story is told in clear and simple language, illustrated at frequent intervals by pictures, sketches, or tabular material. The report occupies 65 pages, is well arranged and printed in readable type.

An introductory statement indicates briefly the scope of the report and pays tribute to the "splendid, public-spirited support" of the members of the association. Brief summaries of the various lines of work during the year are indicated in separate chapters in Part 1. In four counties, public health work is organized under local committees of the Association in such a way that the professional direction of nurses, the keeping of records, the preparation of publicity, and the planning of clinics, for example, are said to have become an active department in the work. Stimulation has been given to the employment of additional nurses, in some cases through interest in special legislation. Among other activities has been the formation of a unique organization called the Three-Quarter Century Club.

Health educational campaigns have been conducted in coöperation with the State Medical Society and national organizations. Through coöperation with the National Tuberculosis Association, a statistical study was conducted, utilizing adjusted rates, which are of course more trustworthy than crude rates. It was found among other things that the average length of life in the state of Maine, according to this study, in 1923, was 52.5 years, as compared with 44.9 for the registration area.

Clinics of various kinds have been developed as educational centers, the general program having first been approved by the Maine Medical Society. These include crippled children's clinics, tuberculosis, child hygiene, and dental clinics.

As one of the aims of this report is to indicate how it is supported, it is fitting that the budget should be given with a list of contributors, and also a section entitled "Kind Words." In this section the State Commissioner of Health notes the coöperation received and also that through these health activities, money has been saved for the people of the state.

Edmonton, Alberta—The 1925 report of the health department of this city of 65,000 people indicates in the brief space of 14 pages the outstanding events and most important statistics of the year. The expenditure for the year was $33,068. A crude death rate of 7.0 and an infant mortality rate of 54.8 are reported. An isolation hospital is maintained where 284 cases, or 81 per cent, of scarlet fever, and 41 cases, or 76 per cent, of diphtheria, were treated.

A staff of 15 is maintained, 2 of whom are child welfare nurses. During the year, 3,868 child welfare, 168 home, and 48 prenatal visits were paid, while 100 clinics were held with an average attendance of 39.

In the laboratory, 876 milk samples were analyzed, and 48.9 per cent of these showed a bacterial count of less than 100,000 per c.c.

International Health Board—The 12th annual report of the International Health Board for 1925 abounds in valuable information concerning public health activities of a world-wide scope. A spot map effectively shows the location of the different lines of activity in which this organization participates. The report is well written, logically arranged, and printed in good readable type on soft paper. Many illustrations add to its attractiveness.

It states, "Every phase of the program is intended to be a step toward helping society to develop its own governmental functions so that health will be greatly improved and fully protected." During the past year assistance was given to public health enterprises of various types in 97 states and countries.

Infection and sanitary surveys were made, operations for control of hookworm, yellow fever and malaria were continued, county and rural health work was extended, and assistance was given the development of special divisions of public health, and the establishment and maintenance of schools and institutions of hygiene and public health. It is particularly interesting to note that 197 fellowships for training in public health for men and women from 27 countries were provided.

Another important feature of the work was the contribution of funds to the Health Section of the League of Nations toward the support of international interchanges of public health personnel, the maintenance of an epidemiological and public health intelligence service, and the training of government health officials in vital and public health statistics.

Commendable progress is indicated in the control of malaria, hookworm, and yellow fever, epidemic conditions of yellow fever having been last seen in 1924 in Brazil and Salvador. "In the absence of outbreaks, the campaign is settling down to the periodic checking up of the danger points and the investigation of every rumor of a case."

Important advances have been made in the extension of rural health services. At the close of 1925, there were 299 full-time county health units in 33 states, and 80 per cent of these had been established in the preceding 6 years.

East Orange, New Jersey—The 1925 report of the East Orange health department follows the outline of the Appraisal Form for City Health Work. On the inside cover page is shown the rating chart of different activities, based on the standard score, which gives a total of 835.7 out of a possible 1,000 points. This is a gain over the previous rating, due largely to extension of activities.

For this city of 62,392 people, there is recorded a crude death rate of 10 per 1,000 population. Of the 964 births, 681 or 70.6 per cent occurred in hospitals, while 45 or 6.6 per cent were attended by midwives. An infant mortality rate of 53 per 1,000 births is reported. The principal causes of death were from organic heart disease (14.1 per cent), chronic nephritis (11 per cent), cerebral hemorrhage (11 per cent), cancer (10.4 per cent), pneumonia (6.5 per cent) and tuberculosis (5.4 per cent).

During the year a full-time bacteriologist was added to the staff, a food handlers' ordinance was passed, and preliminary arrangements were made for the inspection of parochial school children, and the taking over of more baby welfare work by the health department. Diphtheria prevention work has evidently borne fruit, as there has been a notable decline in incidence of the disease since the Schick test and immunization measures were instituted. Four infant welfare stations were conducted, 3 in public schools, and 1 in a Settlement House for colored children, where 431 new babies were cared for. There were 964 births in 1925, with 235 cases under prenatal supervision.

The Milk Inspection Association of the Oranges, made up of 2 members from each board of health and the health officer (five Oranges and Maplewood), exercises supervision over the important problem of securing safe milk. In East Orange it is gratifying to note that 98.4 per cent of the supply is pasteurized, with the remainder certified.

Buffalo, New York—The Annual Report of the Buffalo Department of Health for 1925 presents the salient features of the year's work. This city with a population according to state census of 538,016, had a birth rate of 23.18, a crude death rate of 13.38, and an infant mortality rate of 86.26—the last mentioned figure being the lowest in the history of the city. Of the principal causes of death, organic heart disease headed the list, followed closely by pneumonia and cancer.

In several institutions the Dick test and immunization measures against diphtheria have been utilized while diphtheria immunization activities have been extended. The bureau of sanitation conducted a housing survey during the year which indicated that there is now no shortage of housing facilities, although "rent is still somewhat excessive for the average householder, due to the high cost of construction." A permit system has been inaugurated for all rooming and lodging houses, in order that sanitary conditions may be controlled.

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A brief statement about heliotherapy. Too little about too much.

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A review of experimental studies in protein sensitization and a consideration of human anaphylaxis. Of interest to health officials who are active in diphtheria prophylaxis and hay fever prevention.

ROYER, B. F. Is Trachoma a Deficiency Disease? *Jour. A. M. A.*, 87:7 (Aug. 14), 1926.

Epidemiologic studies fail to show definite indications of a germ cause of trachoma and point to certain facts that might lead to the conclusion that the disease is primarily caused by deficient nutrition. The organisms associated with the condition may be secondary invaders. This hypothesis would revolutionize our attitude toward the disease if it is found tenable.

THEWLIS, M. W. Rejuvenation. *M. J. & Record*, 124:3 (Aug. 4), 1926.

Information for health officers who want a ready answer to questions about "monkey glands."

TOBEY, J. A. Politics and the Public Health. *Scientific Monthly*, 23:9 (Aug.), 1926.

A birdseye view of the present situation in regard to fitness for, and tenure of, office, wherein a spade is not called an "instrument for digging in the ground."

TUNNICLIFF, RUTH. The Identification of the Streptococcus of Scarlet Fever. *Jour. A. M. A.*, 87:9 (Aug. 28), 1926.

The author reports studies in agglutination, by means of immune rabbit serum, for the identification of scarlatinal streptococci, and suggests the use of an opsonic test as a method for earlier identification of the germ.

WADSWORTH, A. B., ET AL. Standardization of Scarlet Fever Antistreptococcus Serums. *Jour. A. M. A.*, 87:9 (Aug. 28), 1926.

A report of a study which indicates that for the standardization of scarlatinal antistreptococcus serums goats are a more reliable subject than human beings.

WOODBURY, R. M. Maternal Mortality. *Children's Bureau Publication*, No. 158, 1926.

A valuable study of the risk of death in childbirth and from all diseases caused by pregnancy and confinement. It presents in readily available form the information upon which to base a rational prenatal hygiene campaign.

PUBLIC HEALTH NOTES

School for Sanitarians—The Fourth Short School for Sanitarians under the auspices of the Texas Association of Sanitarians will be held in Fort Worth, Texas, October 27 to 30, under the general chairmanship of Dr. L. H. Martin, City Health Officer. A series of lectures, laboratory work and assigned reading has been arranged for health officers, sanitary inspectors and other field workers. Certificates of attendance will be issued to those desiring them. The complete announcement can be secured from the Secretary of the Texas Association of Sanitarians, in care of the Texas State Board of Health, Austin, Texas.

Safety Congress—The Fifteenth Annual Safety Congress of the National Safety Council will be held in Detroit, Michigan, October 25 to 29. General sessions will be held on Tuesday afternoon, October 26, and the annual banquet on Wednesday evening. The Health Service Division will meet on Wednesday afternoon, October 27. The program of this division includes:

1. The National Health Problem—Wendell C. Phillips, M.D.
2. Human Salvage—Harry E. Mock, M.D.
3. Fundamental Requirements for Successful Industrial Medical Work—G. H. Van Emburgh, Jr., M.D.
4. Organizing for the Care of the Industrial Wounded—H. N. Torrey, M.D.
5. The Relation of Preventive Health Measures to Labor Stability—Thomas McElroy, M.D.

The complete program of the Congress including the program of the various sections and special meetings may be secured from the National Safety Council, 108 East Ohio Street, Chicago, Ill.

Social Workers Discuss Public Health—At the Twenty-seventh Annual Meeting of the New York State Conference of Charities and Correction to be held at Hotel Statler, Buffalo, N. Y., November 16-19, public health in its relation to the conference program of activities will be discussed. The session on public health has been scheduled for Friday afternoon, November 19. The topics to be considered are: New Outlooks in Public Health, How Far Can Communicable Diseases Be Put Out of Business? Discussion and Demonstration of Administration of Toxin Antitoxin, and Twentieth vs. Eighteenth Century Health Methods.

Fifth Sedgwick Lecture Given at Woods Hole, Massachusetts—The fifth William Thompson Sedgwick Memorial lecture was given this year on July 27th before a distinguished audience at the Marine Biological Laboratory at Woods Hole, Massachusetts. The lecturer was Professor Thomas Hunt Morgan of Columbia University and the Marine Biological Laboratory, and his subject was "Genetics and the Physiology of Development." This dissertation will be published later in book form under the auspices of the Department of Biology and Public Health of the Massachusetts Institute of Technology, of which Professor Sedgwick was for many years the chief.

The Sedgwick Memorial lectureship was established in 1922 to perpetuate the memory of this great leader and to commemorate his services to the cause of biology and public health. Up to this year the lectures have been given annually at the Massachusetts Institute of Technology by men of distinguished eminence in the field of biology or public health. The previous lecturers have included: Dr. Edmund B. Wilson of Columbia University, Dr. William H. Welch of Johns Hopkins, Dr. W. J. V. Osterhout, formerly of Harvard and now with the Rockefeller Institute, and Dr. Charles V. Chapin, Superintendent of Health, Providence, R. I.

Dr. Carey Given Degree of Dr.P.H.—Dr. Bernard W. Carey, director of the Child Health Demonstration at Athens, Ga., has been given the honorary degree of Doctor of Public Health by the University of Georgia in recognition of his services with the Athens Child Health Demonstration.

The Athens demonstration is one of the program of demonstrations being conducted by the Child Health Demonstration Committee financed by the Commonwealth Fund.

American **Association of Psychiatric Social Workers**—The Section on Psychiatric Social Work of the American Association of Hospital Social Workers formally disbanded at its fourth annual meeting held at Cleveland, May 26, 1926, and a new independent organization, the American Association of Psychiatric Social Workers, was formed.

As the greatest developments in recent years in psychiatric social work have been outside of the hospital field and more closely allied to general social work, after careful consideration, the Section on Psychiatric Social Work decided to withdraw from the parent organization.

The officers of the American Association of Psychiatric Social Workers are: Mrs. Maida H. Solomon, Boston Psychopathic Hospital, Boston, Massachusetts, President; June Lyday, Iowa Psychopathic Hospital, Iowa City, Iowa, Vice-President; Kathleen Ormsby, National Committee for Mental Hygiene, New York City, Secretary-Treasurer; other members of the Executive Committee, Sarah Ivins, Bureau of Children's Guidance, New York City; Mary C. Jarrett, Boston, Massachusetts; Grace F. Marcus, National Committee for Mental Hygiene, New York City; Katharine Moore, Michael Reese Dispensary, Chicago, Ill.; Helen L. Myrick, Illinois Society for Mental Hygiene, Chicago, Ill.; and Mildred C. Scoville, Commonwealth Fund, New York City. The secretary's address is 370 Seventh Avenue, New York City.

CHICAGO'S HEALTH COMMISSIONER HONORED

Dr. Herman N. Bundesen, Health Commissioner of Chicago and Fellow of the American Public Health Association, has been given the Victor F. Lawson $1,000 award for having "performed within the borders of Greater Chicago the most beautiful action or to have done the most beneficial thing for humanity." The award, established in memory of its late publisher, Victor F. Lawson, was given by the *Chicago Daily News*, September 9, 1926, in recognition of Dr. Bundesen's work for the health of children, and particularly the pure milk campaign which he inaugurated and carried through.

Speaking editorially, in the issue announcing the award, the *Daily News* says: "It would take a good deal of space to recount the many forms of effort set forth by Chicago's Health Commissioner to protect human lives. In particular, however, his pure milk campaign has demonstrated the forcefulness of his methods. . . . The official head of the Chicago department of health, who, having given due warning to all concerned that after a certain day last spring no milk except that from tuberculin-tested herds should be sold for consumption in this city, had the courage and the determination to put the order into effect, performed a beneficial action of immense value to the community. That action gives the city's little ones a measure of protection that should be a source of thankfulness to every parent. Dr. Bundesen's enlightened stand cannot fail to exercise an important influence upon public opinion in other communities. It must hasten the day when milk from diseased cows will be tolerated no longer by health authorities anywhere."

LABORATORY

C. C. Young

THE PREPARATION AND STANDARDIZATION OF TUBERCULIN

Esmond R. Long

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TUBERCULINS are preparations obtained from the tubercle bacillus which elicit a specific inflammatory response in tuberculous animals, but are non-toxic for normal animals. A great variety of preparations of tuberculin are used in the diagnosis of tubercle bacillus infection and in specific treatment of the disease. They consist in general either of the filtered broth on which the bacilli have been grown or of preparations derived by chemical fractionating means from the body of the bacillus itself. There is much reason to believe that the active substance in the broth upon which the bacillus has been grown is present as a result of partial disintegration of bacillary bodies in the medium during the course of growth, and not as the result of any special excretion or secretion.

In the preparation of tuberculin it is highly desirable that the medium of growth be limited to substances of known chemical composition. It is true that most of the tuberculin on the market today is prepared from meat infusion and peptone broths, both highly complex mixtures, for which no chemical formulas could possibly be written. This is true simply because it has been found convenient to use the same media which are employed in general bacteriology. Nevertheless this is a thoroughly antiquated procedure which should have no place in the manufacture of tuberculin.

It is scientifically wrong to use in the preparation of a substance for diagnosis, substances which themselves represent unknown factors. No two preparations of glycerol bouillon for the growth of the tubercle bacillus, made on a peptone-veal infusion or peptone-meat-extract basis, could possibly be the same. Such preparations contain proteoses, peptones, polypeptides, amino acids and other protein decomposition products and a salt content, all of which vary widely in their proportions, according to the source of the material used and the manner of preparation. The peptone is the result of protein digestion, usually complicated in spite of the utmost precautions by a certain amount of bacterial digestion. Peptone is deliquescent and peptone preparations absorb water from the air, which permits the growth of bacteria in the stock material. The products of bacterial digestion add to the complexity of the substance.

All of the complex substances just mentioned with the exception of those actually used by the bacteria in the course of growth, remain incorporated in tuberculin broth filtrates of the Old Tuberculin and Bouillon Filtrate types. It is true that in the quantity used in diagnostic tests the toxicity of these complex products is usually so far below that of tuberculin for the tuberculous subject, that no danger exists of a false reaction and corresponding misinterpretation. Nevertheless unexplained non-specific reactions with tuberculin do occur, and it is only logical to rule out the possibility that these may be due to the medium and not to its tuberculin content.

The same objections which apply to broth filtrates hold for preparations of tubercle bacilli grown on such media. A certain amount of the original medium adheres to these bacilli in spite of thorough washing, and variation in composition of the bacterial body as a result of simple absorption from the medium without synthesis into bacterial protoplasm, undoubtedly occurs when bacteria are grown on different media. Hence, it is just as desirable to have bacilli of standard composition for the preparation of tuberculin, as far as this is possible, as it is to have broth filtrate tuberculins uniform.

PREPARATION OF TUBERCULIN

This uniformity of composition of tuberculin broth and tubercle bacilli is possible only through the use of media of known and standard chemical composition. For over 30 years various investigators have been growing

tubercle bacilli on media of known and relatively simple chemical composition. Such media, whenever they permit good growth of tubercle bacilli, invariably become active tuberculins after a few weeks growth of the bacilli. It is perfectly possible to obtain fully as good growth on such media as is ever obtained on any kind of peptone or veal infusion broth, with the development of tuberculin preparations fully as potent. In the last few years we have been using a medium[1] of the following composition, on which tubercle bacilli of both high and low virulence multiply luxuriantly, producing a highly potent tuberculin and clean white bacilli suitable for exact chemical work:

Asparagin	5.0
Ammonium citrate	5.0
Potassium acid phosphate	3.0
Sodium carbonate (dry)	3.0
Sodium chloride	2.0
Magnesium sulphate	1.0
Ferric ammonium citrate	0.05
Glycerol	50.0
Water	1000.0

The composition of this medium is such that titration is unnecessary, and it is sufficiently well buffered to stand the addition of a moderate amount of acid or alkali in the course of bacterial metabolism without much change in reaction. The materials are weighed out and a solution made, which is filtered if it is not absolutely clear, and sterilized in the autoclave in the usual manner. Luxuriant growth occurs in the course of one month after inoculation of plaques of tubercle bacilli, a yellowish color and the characteristic odor of tuberculin preparations developing. At least 100 gms. of moist bacilli to the liter should be secured. In the preparation of tuberculin from this medium the bacilli are filtered off through paper, and the filtrate is then put through a filter of the Berkefeld type. The filtrate is then preserved with 0.5 per cent phenol or other suitable preservative.

Tuberculin prepared from this medium invariably contains protein, and tests have shown that this protein itself is an extremely potent tuberculin, containing, if not itself constituting, the active principle. Similar protein, also highly active, may be extracted by suitable chemical procedure from the bacilli grown on the medium. Inasmuch as no protein was present in the original medium, this protein in its entirety is the result of bacterial synthesis, and hence may be considered absolutely specific material for diagnostic and therapeutic use of tuberculin, differing enormously in that respect from tuberculins prepared from commercial peptone, meat extract and veal infusion, which are inconceivably complex mixtures of ill-defined and unknown substances to begin with.

THE STANDARDIZATION OF TUBERCULIN

It is obviously desirable to have a standard means of determining the strength of tuberculin preparations. It is particularly important in therapeutic use of tuberculin where new supplies of tuberculin for treating the same patient are necessary from time to time. For diagnostic use the chief requirement is potency; yet here also results have little comparative value unless the approximate strength of different preparations is known.

The methods which have been proposed for standardizing tuberculin are summarized elsewhere.[2] Methods used at present in the standardization of tuberculin may be grouped as (1) those based on the action of tuberculin on the hypersensitive (tuberculous) animal, and (2) those based on the interaction of tuberculin and serum antibodies in the tuberculous or artificially immunized animal. Under (1) are included those methods in which the lethal dose of tuberculin for a tuberculous animal is determined, and methods in which an attempt has been made to put the skin test in tuberculous animals on a quantitative basis. There are objections to both precedures.[2] The method by which the minimum lethal dose for a tuberculous guinea pig is determined, is altogether too gross, too many unknown factors being concerned in the death of an animal already sick. The method by which the ultimate dilution giving a cutaneous test in a tuberculous guinea pig or man is determined, is unreliable because of the wide individual variation in skin reaction capacity in animals and man.

OBJECTIONS TO METHOD

There are still more fundamental objections to the methods of (2), *i.e.*, the precipitin and complement fixation reactions which occur when tuberculin preparations and the serum of tuberculous or immunized animals are brought in contact. We have no assurance that the substance which reacts with the serum of the tuberculous or artificially immunized animal is the same substance which elicits the skin reaction in the tuberculous animal, and we have much evidence that it is not. At a recent conference on tuberculin in Washington, Pinner reported a wide divergence in the activity of tuberculin preparations as antigen in the serum reactions and in the skin test.

TUBERCULIN IN DIAGNOSIS AND THERAPY

Tuberculin is used in diagnosis and therapy as a specific agent in an *allergic* subject giving an allergic response. It is safe to assume, therefore, that until we have the active principle isolated in such form that it can be measured chemically, the allergic response, the only means by which we can surely detect tuberculin, should be the basis of a method of standardization. The deficiencies in the two methods commonly used, the lethal dose and cutaneous test procedures have been pointed out, and another method of standardization has been suggested[2]—likewise based on the phenomenon of allergic response, but more accurate in its results. It is admittedly time consuming and more cumbersome in its application.

The basis of this test is the remarkable sensitiveness of the germ cells of the tuberculous male guinea pig to tuberculin. Minute doses of tuberculin injected into the testis of a tuberculous guinea pig lead to a prompt exudative inflammatory reaction of the same type as that occurring in the skin, and in addition to degeneration and necrosis of the spermatocytes and their derivatives. In concentrations a thousand times as great, tuberculin is non-toxic to the testis of the normal animal. If the tuberculous animal is allowed to live one month after the injection of tuberculin into one testis, complete or partial abolition of spermatogenesis, according to the strength of the tuberculin injected, is observed on microscopic examination of sections. The testis is much atrophied, and spermatozoa and spermatids have disappeared. All the original tubercles persist, lined however by undifferentiated cells. The reaction seen at the end of 24 hours shows that the chief injury is to the spermatocyte, or second stage in the maturation cycle of the germ cell. Hence, I have called this the "spermatocyte reaction."

AS A STANDARDIZING TEST

The test is quite specific. A long series of observations indicates that the variability in reaction in the testes of different guinea pigs is far less than that of skin. The trauma incident to injecting the testis with a sharp needle is much less than that occurring in shaving the skin and injecting it intracutaneously. The reaction is positive with dilutions of tuberculin which do not elicit a reaction in the less sensitive skin. Inasmuch as the necrosis of the highly sensitive cell is such a conspicuous feature of the reaction, the abolition of function of this single cell can be made the basis of a standardizing test. It is thus a far more delicate standardizing test than the gross test of minimum lethal dose for a tuberculous pig.

UNIT OF MEASUREMENT OF TUBERCULIN STRENGTH

These considerations have led to the proposal of the following unit as a measure of tuberculin strength: "The spermatocyte unit is that quantity of tuberculin just sufficient to abolish spermatogenesis in the majority of tubules on injection in a volume of 0.1 c.c. into the testicle of a 400 gm. guinea pig with a mild localized tuberculosis of one month's duration. Microscopic sections of the testicle (middle cross section) one month after the injection of one unit or more show the majority of the tubules atrophied and lined only by spermatogonia. No normal spermatocytes, spermatids or spermatozoa are present. The test is controlled by examination of the non-injected opposite testis, and of the injected testis of a non-infected animal, both of which should show normal spermatogenesis."

Ordinary samples of Old Tuberculin, which is a ten times concentrated broth filtrate, contain from 10,000 to 100,000 spermatocyte units per c.c., while broth filtrates which are not concentrated, such as BF or tuberculin prepared from the medium described above, contain about 10,000 units per c.c. That is, 0.0001 c.c. will abolish spermatogenesis in the majority of tubules seen in a cross section of the testis of a tuberculous guinea pig under the conditions of the test.

The chief disadvantages of the method are the time required for the test, and the time and mechanical labor necessary in making sections. I believe these are more than offset by the delicacy and accuracy of the test. It is of course not a suitable test for the qualitative recognition of tuberculin where large numbers of substances are under examination. When it is desired simply to know whether a substance contains the active principle of tuberculin or not, the skin test is good enough. But for large batches of tuberculin made on a standard medium it should prove entirely practical.

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PHENOL METHYLENE BLUE STAIN

THEODORE C. BUCK

Bureau of Bacteriology, Health Department, Baltimore, Md.

PHENOL methylene blue stain is an improved stain for Breed's direct counts on milk, cream, evaporated milk and condensed milk.

This stain has quick penetrating qualities and is quickly decolorized by ordinary 95 per cent commercial alcohol (ethyl or methyl). It does not cause the smears to wash off from cream, evaporated and condensed milk, as they do in the case of other stains.

It stains deeply blue the organisms and cells and leaves a clear transparent field around them. Its keeping qualities are excellent; in fact, the older the better.

The author has made about 2,000 comparative counts with the standard method stain, and finds this stain satisfactory in every detail required. It has also been found to be a great time saver for laboratories doing a large number of counts, since the slides can be decolorized much more quickly than when the methylene blue stain recommended by standard methods is used.

FORMULA

Sat. sq. sol. of methylene blue.....	10 c.c.
Filter after standing 24 hours.	
Phenol sol. 2.5 per cent.....	90 c.c.
Filter and use.	
	100 c.c.

VITAL STATISTICS

LOUIS I. DUBLIN, PH.D.

Infant Mortality: Statistical Report—Tabulations were made covering 697 cities of over 10,000 population (according to the 1920 census) within the death registration area in the United States. Of 641 cities in the birth registration area, 632 cities reported. With the exception of 60 of them, data for these cities were taken from the Census Bureau Summary of Provisional Birth, Death and Infant Mortality figures. Information for the rest of the cities was gathered from state and local authorities. All rates received are "crude" rates with the exception of New Jersey which published "corrected" rates.

The rate for 632 cities in the birth registration area for 1925 was 72.6, slightly in excess of the 1924 rate of 72.2 for 629 cities. In 1925, the lowest rate recorded for any city was 32. This rate was given for Stonington, Connecticut, and for Winona, Minnesota. These cities are in the group with populations between 10,000 and 25,000. In the next larger population group, 25,000 to 50,000, Oak Park, Ill., was lowest with a rate of 35. In the population group 50,000 to 100,000, Union City, N. J., was lowest with a corrected rate of 38. Salt Lake City, Utah, with a rate of 45 was lowest in the group from 100,000 to 250,000 population. Among the largest cities, 250,000 and over, Seattle, Wash., was lowest with a rate of 45. The highest rates in each of the population groups beginning with the largest were Washington, D. C., 87; Norfolk, Va., 97; Huntington, W. Va., 110; Pensacola, Fla., 124; and Martinsburg, W. Va., 156. The rates for many southern cities are raised by the high infant mortality reported for the negro population, shown by Washington's rate for whites of 67 whereas the colored rate is 131.

Records of cities not in the birth registration area but in death registration area are of insufficient accuracy and were tabulated separately. Of this group Boise, Ida., with a rate of 57 was lowest in the population group of 10,000 to 25,000, while Jefferson City, Mo., was highest with a rate of 133 in the same group.

Of those in the population group 250,000 and over, St. Louis, Mo., had the lowest rate, 67, while New Orleans, La., had the highest rate, namely, 98.

Confining our calculation solely to the birth registration area, Utah with a rate of 47 stands first in infant mortality for urban population, Oregon comes next with 48, and Washington

ranks third with a rate of 50. Thirty-one states report in the birth registration area and 15 show reductions during the last year, namely: California, Florida, Illinois, Maine, Maryland, Mississippi, New Jersey, New York, North Dakota, Oregon, Rhode Island, Utah, Vermont, Washington and Wyoming. In 1923 Wyoming with its two cities had a rate of 102; in 1924 the rate was 73 and in 1925 the rate was 51.

Infant mortality rates for cities grouped for size show a remarkable similarity. In the birth registration area, cities of 250,000 population have a composite rate of 71.2 while at the other extreme stands the population group 10,000 to 25,000 with a rate of 76.0.—*Infant Mortality Statistics 1925.* Am. Child Health Assn., 21 p., June, 1926.

Health Improvement in New York City, 1900 to 1925—The quarter of a century elapsing between 1900 and 1925 witnessed in the white population of New York City substantial reductions in the principal respiratory diseases, pulmonary tuberculosis and the pneumonias. In 1900 the death rate per 100,000 white population was 232 for tuberculosis, in 1925 the rate was reduced to 67. The decrease is 71.1 per cent. In 1900, the pneumonias gave a death rate of 300 and by 1925 the rate had fallen to 127. This is a decrease of 57.7 per cent. Bright's disease and nephritis decreased by 60.0 per cent. The death rate for 1900 was 183; in 1925, 82.

The decrease in Bright's disease and nephritis death rate is due in part to better diagnosis and more precise recording in death certificates practiced in recent years.

In spite of the phenomenal increase in motor vehicles and in accidents arising from their use, deaths by violence have become relatively fewer. In 1900, the rate of deaths by violence per 100,000 white population was 112; in 1925, 95. The per cent decrease is 15.2.

By contrast, the rates for cancer and for heart disease have both increased. In 1900, the cancer death rate per 100,000 white population was 67, in 1925, 109. Heart disease with a death rate in 1900 of 181 rose to 237 in 1925. The increase in percentage from 1900 to 1925 for cancer is 62.7 and for heart disease, 115.0.—Dept. of Health *Weekly Bulletin*, June 19, 1926.

Prohibition Conditions in 1925—The Moderation League determined to make a comprehensive survey in order to learn just what conditions were in the United States with reference to prohibition. Communications were made with the police departments of every city or town in the United States having a population of 5,000 or more.

The resulting tabulation covers arrests for drunkenness for the years 1914 to 1924 in 350 places, and information for 457 places during 1920–1924. In 1918–1919, emergency war time restrictions on alcoholic liquors brought about an astonishing drop in drunkenness. At the end of 1919 the Volstead Act went into effect causing a further drop in 1920, but immediately after in 1921 there was an enormous increase which continued in 1922 and later years. By 1924 arrests for drunkenness rebounded to just about the level of preprohibition years. Arrests for drunkenness in 350 places in 1914 were 506,737, dropped to 226,070 in 1920, and in 1924 rose to 498,752. The same rise occurred in the 457 places, increasing from 258,974 in 1920 to 565,026 in 1924.

An interesting disclosure is that in former "dry" states, *i.e.*, states which had some form of state prohibition or semi-prohibition law before the 18th Amendment was adopted, conditions are worse to-day, under the bone-dry Volstead Act than they formerly were under their own state dry laws.

When the Volstead Act was ratified on January 16, 1919, only 6 states containing 4.2 per cent of the United States population were bone-dry by popular vote; 6 other states with 7.6 per cent of the population were bone-dry by legislative act and 18 states with 55.7 per cent of the population were wet. The remaining 18 states with 32.5 per cent of the population were neither wet nor dry in any Volstead sense. While they had restrictive laws tending to abolish saloons they afforded some lawful method for citizens to obtain beverages.

The replies from police departments show a remarkable uniformity in reporting a marked increase in the number of drunken drivers as the result of national bone-dryness. The number of drunken drivers before 1919 had been more or less constant from year to year showing small fluctuations with a tendency toward a gradual rise commensurate with the increase in the number of automobiles. At the end of 1919, coincident with the enforcement of the Volstead Act, drunken drivers increased amazingly and continued year after year since then. To be exact, motor vehicles in the United States increased from 1919 to 1924 by 132 per cent, whereas drunken drivers increased in the same period about 354 per cent on the average.

There has been an increase in the number

of drunken children. A study of Washington, D. C., for the 4 preprohibition years 1914–1917 reveals arrests of persons under 22 years of age, averaging 44 a year. Immediately after the Volstead enforcement youthful drunkenness increased. In 1918 it rose to 73 and by 1924 had reached 282, an increase of 540 per cent above the preprohibition level. Meanwhile arrests for drunkenness of persons of all ages merely rose to preprohibition level, demonstrating that, relatively as well as absolutely, drunkenness among young people increased enormously. This condition in Washington merely confirms what is known to exist throughout the rest of the country.—The Moderation League, Inc., New York, N. Y. National Survey of Conditions under Prohibition, 1925. 18 pp.

Prague: Infectious Diseases—The State Statistical Institute recently published figures concerning infectious diseases during 1920–1924. The year 1921 was an epidemic year. Typhoid fever in September and October rose as high as 60 cases per 100,000 population and in the winter dropped to 30. The highest rate in 1921 was 102 for the month of September. Scarlet fever while very low in 1920 became epidemic in 1921 reaching the peak in October with a rate of 210 per 100,000 population. The following years showed regular epidemics of scarlet fever in the fall with a maximum incidence in October, the rate being around 100 per month. As the birth rate rose after the war, there was a rise in the incidence of scarlet fever. In 1924 the scarlet fever rate was 68.7 while the typhoid fever rate was 48.8. Diphtheria continued to be as rare as it was during the war. The years 1920 and 1921 brought epidemics of dysentery. In the summer months the rate rose to more than 210 per 100,000 population. Typhus fever and smallpox became negligible factors, the 1924 rates were 0.3 per 100,000 and 0.1 respectively. The very low smallpox rate is the result of enforcement of compulsory vaccination throughout the country.—*Jour. A. M. A.*, 87:45 (July 3), 1926.

Vital Statistics: Southern India—The population according to the 1921 census was 41,002,696, of which Hindus comprised 89.48 per cent, Mohammedans 6.95 per cent, native Christians 3.2 per cent, and other classes 0.04 per cent.

The registered birth rate during 1922 was 30.1 per 1,000 but it is fairly certain that the actual rate is as high as 42.5 per 1,000. Registration in municipal towns is carried out by paid registrars, but in rural areas which comprise a total population of nearly 36 millions as compared with 5 millions of townspeople, registration is done by untrained village officers. In Madras City, where registration is more or less accurately performed, the birth rate for 1922 was 41.2. During 1922, of a total of 215 towns, 13 registered a birth rate of 40 to 50 per 1,000 and 6 returned the amazingly high rate of over 50 per 1,000.

The registered death rate for 1922 was only 21 per 1,000 but the actual rate was probably somewhere between 33 and 36 per 1,000. In Madras City the death rate in 1922 was 43.1 per 1,000. A severe outbreak of plague in another town caused the death rate to rise to 70 per 1,000.

Infant mortality is very high, although the registered rates since 1920 show a distinct downward tendency during the past 22 years. In several of the largest towns the infant death rate in 1922 ran between 311.6 and 352.8 per 1,000 births as compared with the English rate of 80 per 1,000. The infant mortality rate among the Hindus in Madras City, as a whole, is about 300 per 1,000 births, while among the Brahman babies, the rate is a little over 100 per 1,000 births—more nearly like that of England.

Comparing death rates for males and females, the most striking feature seen is the great increase in female deaths in the childbearing age group of 15 to 20 years. This continues to a lesser degree in the period 20 to 30 years.

For the whole population, the approximate mean duration of life is 27.6 years as compared with over 50 years in England and Wales in the period 1901–1910.—Russell, A. J. H., *Scient. Monthly*, 23:57–60 (July), 1926.

The Official Vital Statistics of the Republic of Austria—Health statistics in Austria are centralized in a special section of the Office of the Department of Public Health, under the control of a medical expert. Since the reorganization in August, 1918, of the Ministry of Public Health of which the present Public Health Office is the direct descendant, health statistics have been dealt with by that office, whereas formerly their elaboration was left to the Health Department of the Ministry for Home Affairs.

The Public Health Service obtains its statistical data either from the provincial and communal authorities or from organizations

such as hospitals, asylums, etc., which submit reports upon forms provided for the purpose.

Each of the various ministries of the government has its own statistical department and the Central Statistical Commission coördinates and publishes the statistical data received by these offices. It is thus possible to make extensive surveys of the whole field of national statistics and statistics of commerce, labor, health, etc. There are a number of current and annual statistical publications, the most comprehensive being the Statistical Handbook for Austria.

Registration of live births has been compulsory since 1857.

The definition of stillbirths is as follows. All children who, being born dead, have reached a stage of development which indicates the possibility of independent existence are to be registered, but all the others, *e.g.*, non-viable children, are to be regarded as abortions or miscarriages, and registration of such births is not required. Registration of deaths is compulsory, the registers of deaths being maintained by the clergy of the different acknowledged religious denominations, and for other faiths by the civil authority. Each declaration of death is accompanied by a certificate, signed by the medical practitioner in attendance which records both the primary and immediate cause of death. A large number of communicable diseases are notifiable. Venereal diseases must be notified by the medical practitioner observing them. Tuberculosis must be notified when occurring in any kind of an institution.

The latest death rates given in this report refer to the year 1923. The highest death rate occurred in the province of Burgenland, 18.28 per 1,000 population, and the lowest in Vienna, 13.65. Remaining rates end with 1913.—League of Nations: Health Organization, *Statistical Handbook Series No. 5*, 1925.

Tuberculosis in Budapest—The pulmonary tuberculosis death rate in Budapest from 1874 to 1924 has been very high throughout, the lowest rate being 284 in 1914; and the highest 855 in 1876. A rapid fall occurred between 1874 and 1900, from about 800 to about 400 per 100,000 population. A slower fall occurred between 1900 and 1914, the 1914 rate being 284. The war period interrupted the fall. Since 1918, however, the tendency to fall has been resumed, but the pre-war level has not yet been approached, the 1924 rate being 339.—*Tubercle*, 7:391 (May), 1926.

Results of Wassermann Tests—During the 10 years from January, 1916, to the end of December, 1925, over 75,000 Wassermann tests have been made in the laboratories of the University of Toronto in connection with the Toronto General Hospital.

The incidence of syphilis in the wards of the hospital has dropped from 10.4 per cent in 1916 to 5.8 per cent in 1925. This drop has been coincident with, and may be due in part to the development of an efficient out-patient clinic for syphilis. The incidence of syphilis as shown in the routine tests in the wards of the Toronto General Hospital compares favorably with the incidence reported from similarly situated hospitals in other cities.

Only 1.1 per cent of the new-born in this hospital are found to have a positive Wassermann test. Many syphilitic mothers bear non-syphilitic children.

In the special clinic for syphilis in the Out-Patient Department of the Toronto General Hospital, more cases of primary syphilis are being detected now than in former years, but the figures for the new cases of tertiary syphilis remain so high that it becomes very evident that efforts for the education of the general public regarding the dangers of this disease must be redoubled if the victims of infection are to be attracted to the clinics at an early stage of the disease.

Routine tests in the Out-Patient Department would in all probability enable the staff to detect many cases of unsuspected syphilis. Evidence has accumulated from various medical centers showing that clinical examination and history-taking are only from 35 to 40 per cent efficient in diagnosing syphilis in adults.

In the Hospital for Sick Children, Toronto, careful statistics show that an extremely small percentage of syphilitics are detected by the routine Wassermann test that would otherwise be missed. They have, therefore, abandoned the routine use of the test, but employ it freely in all suspected cases. The incidence of syphilis in their wards is very similar to that of the new-born at the General Hospital, namely 1.5 per cent.

It is hoped that other medical centers in Canada may be induced to place their figures on record in some such way as has been attempted here and thus assist in ascertaining the truth about the prevalence of syphilis in this country.—H. K. Detweiler, *Canad. M. A. J.*, 16:800-803 (July), 1926.

Eclampsia at Chicago Lying-in Hospital—During eight and one-half years, July 1, 1917, to January 1, 1926, 29,587 obstetric cases were attended by Chicago Lying-In Hospital, 20,226 were delivered at the hospital and 9,361 were delivered at home by the hospital dispensary service. Of the total 29,587 patients, there were 83 who had eclampsia, an incidence of 0.28 per cent. Seventy-eight of these patients were admitted to the hospital and formed the basis of this analysis. Among these 78 cases, there were 6 maternal deaths (7.7 per cent). Deducting one moribund, untreated patient, the mortality is reduced to 6.5 per cent. In 50 per cent of the cases convulsions began before labor, in 20.5 per cent during labor and in 29.5 per cent after delivery. The maternal mortality for these groups was 10.3, 0 and 8.7 per cent, respectively, and the fetal mortality was 41, 18.8 and 17.4 per cent, respectively. The incidence of operative deliveries was 62.5 per cent. However, while 36.3 per cent of all the labors terminated spontaneously, labor had been induced in 11.3 per cent of them. Hence, only 25 per cent of the patients had both a spontaneous onset and spontaneous termination of labor. Convulsions ceased after delivery in 78.2 per cent of all the cases in which they began ante- or intra-partum. Among the 15 abdominal cesarean sections, convulsions began before operation in 12, and in all of these cases the convulsions ceased after operation. The maternal mortality for the various forms of delivery was: spontaneous, 3.4 per cent; cesarean section, 6.7 per cent; forceps, 9.5 per cent, and version and extraction, 14.3 per cent. The fetal mortality for these groups was: forceps, 9.5 per cent; abdominal cesarean section, 17.6 per cent; version and extraction, 28.6 per cent; spontaneous, 30 per cent, and vaginal cesarean section, 100 per cent. Of the 78 patients, 59 per cent had no prenatal care, 23 per cent had very poor observation during pregnancy, and 18 per cent had good prenatal care. There were 5 pairs of twins (6.4 per cent). Among the 83 babies there were 23 deaths (27.7 per cent). However, the fetal mortality of the 75 babies that were alive, when their mothers entered the hospital, was only 20 per cent. Of the 15 dead babies that constitute this 20 per cent only one weighed more than 2,000 gm. (4 pounds, 7 ounces). Only 62.7 per cent of all the babies weighed 2,000 gm. or more.

Of the 72 patients who left the hospital alive, 60 (83.3 per cent) were traced. Of this number, 2 died of chronic nephritis, 3 now have chronic nephritis, and 55 (91.7 per cent) are well. Among 18 subsequent pregnancies, 10 ended normally and one is in progress now. One patient had another attack of eclampsia, and 3 had preëclamptic symptoms for which the pregnancies were ended. Hence, among the patients who completely recovered after the attack of eclampsia, 26.7 per cent of those who subsequently became pregnant developed signs and symptoms of toxemia. These patients again recovered completely.—J. P. Greenhill, *Jour. A. M. A.*, 87: 228–232 (July 24), 1926.

Smallpox in American and Canadian Cities, 1925—In 747 cities in the United States and Canada, the smallpox case fatality rate (deaths per 100 cases) in 1925, was 3.1. This may be compared with the rate of 2.5 for the same cities in 1924—an increase of 24 per cent. The 1925 figure is more than five times as high as that shown for 1923, when there were only 0.6 deaths per 100 cases. The actual number of smallpox cases reported from these cities in 1925 was 15,563, as compared with 23,589 in 1924; and the actual number of deaths declined to 477 in 1925, from 595 in 1924. It is thus obvious that while smallpox was considerably less prevalent in 1925, the type which prevailed was more virulent—as shown by the higher lethality. The case fatality rate in 94 Canadian cities was approximately one-eleventh of that prevailing in 653 cities in the United States.—*Stat. Bull.*, M. L. I. Co., June, 1926, p. 4.

Public Health in Formosa—A zealous warfare against rats for the past ten years has kept Formosa quite free from bubonic plague. The primitive system of nightsoil disposal has resulted in many types of intestinal and other parasites.

Malaria is a serious problem in Formosa and energetic measures are taken to combat this disease. At least ten species of Anophelene mosquitoes are found on the island, these are potential malaria carriers, almost without exception. The A. minimus and A. maculatus are considered to be common vectors of subtertian malaria while the A. sinesis (hyrcanus) another prevalent mosquito transmits the benign—tertian and quartan fevers.

The local anti-malarial measures include drainage and reclamation of swamps and the introduction into ponds and lakes of mosquito-eating fish.—Severn, A. G. Millott, *J. Roy. San. Inst.*, 46:619 (June), 1926.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C.E.

Inhibitory Properties of the Waters of the River Iser and Various Bacterial Cultures—We have extended to other regional water courses the observation of inhibitory action exerted on the cultures of certain microbes of the intestinal group by the river waters (the Rhone and the Saone) studied by one of us. (F. Arloing and Sempe, *Compt. rend. Soc. de Biol.*, 41:667.) We now present experiments made with water from the River Iser.

The Iser River water was collected, (a) above the city of Grenoble near the Green Island Bridge (Sample 1), (b) at the middle of the city (Sample 2), (c) just below the city (Sample 3), (d) below the outlet of the east city sewer at the abattoir wharf (Sample 3), and (e) 7 kilometers below Grenoble near Veurey (Sample 4).

The collections were made on January 5, 1925, at low water stage. The 4 samples were filtered through a (Chamberland L 3) filter and tested out against 3 strains (*B.D.* and *P.*) of *B. coli*, also against *B. typhosus*, *B. paratyphosus A*; *B. paratyphosus B* and a *B. dysenteriae* (Shiga). These cultures had already been utilized in our researches with river waters from the Lyon district.

The inhibitory power has been sought by adding 2 c.c. of the Chamberland filtrate to 10 c.c. of ordinary broth previously seeded with 4 drops of a 24-hour culture or else by planting this mixture on ordinary agar. The cultures were stored for 24 hours at 37°, then left at laboratory temperature (15 to 16°). The intensity of the lysis was recorded as zero (complete lysis) to 6 (culture with a turbidity equivalent to that of the control cultures).

Our results may be summarized in 2 groups, the first corresponding to Samples 2 and 3, and the second to Samples 1 and 4.

1. Samples 2 and 3—water collected in the immediate vicinity of Grenoble

Bouillon cultures seeded with a 24-hour growth; no lysis (turbidity = 6) with *B. coli* strains D and P and with the Shiga bacillus

Lysis of 5 with *B. coli* (strain B?) and with *para B*

Lysis of 1.5 with *B. typhosus*

Lysis of 1 with *para A*

Agar cultures. Normal growth (5.5 to 6) for *B. coli* strains B, D and P, also Shiga and *para A*; granular growth with small plagues ("Plages") (3.5 to 4) for the *Eberth bacillus* and *para A*

2. Samples 1 and 4—Green Island and Veurey

Bouillon cultures seeded with a 24-hour growth

Lysis 5.5 with *B. coli*, strains D and P, and with the *Shiga bacillus*

Lysis 4.5 to 5 with *B. coli* and *para B*

Almost complete lysis (0.5) with the *typhoid* and *para A bacilli*

Agar cultures. Very granular (1.5 to 2) for the *typhoid bacillus* and *para A*; normal—6, for the other species

When the seeding of the cultures subjected to lysis was made with a 48-hour growth, the phenomenon was less intense. It reached a value of 3.5 to 4 for *B. typhosus* and *para A* and did not exist with the other cultures.

Attempt to increase the virulence. Five successive transplants in bouillon were made. They always gave complete lysis (turbidity = 0) for the typhoid organism (Eberth) and *para A*, without any increase of virulence for *B. coli*, strains B, D and P, Shiga and *para A*.

The liquid culture seeded on agar gave the following results on each successive transplant:

Normal cultures with the usual sheen (glacis) or but little granular for *B. coli B*, D, and P, *para B* and Shiga after each transfer. Hence no exaltation (of virulence).

For the typhoid and *para A* organisms the cultures rarely showed large plagues (lysis 1.5 to 2) after the first transplant. They were more abundant and very granular (lysis = 3) after the second transplant and became numerous and very finely granulated (lysis = 4) after the third transfer to bouillon which, however, remained completely clear. The phenomenon which persists in liquid medium therefore appears to diminish appreciably on solid medium.

We are now studying the pH of the waters of the Iser and of the nutrient media in respect to the inhibitory action mentioned in this report. A report on these studies will ultimately be made.

Summarizing:

1. The waters of the river Iser showed a marked inhibitory action, almost complete in respect to liquid cultures of *B. typhosus* and *para A*.

2. This action is especially marked for the waters collected above or below the city of Grenoble.

3. The waters of the Iser do not possess as intense anti-coli properties as the waters of the Saone or as well-defined as those of the Rhone.

4. On the other hand, the water of the Iser possesses remarkable inhibitory powers in respect to the *para A* bacillus. Those properties are feeble or nonexistent in the waters of the Saone and the Rhone.—Fernand Arloing and Chavanne, *Comptes Rendus des Seances de la Societe de Biologie*, 42:257 (Jan. 19), 1925. Abstracted by E. J. Theriault.

Refuse and Sewage Disposal at Hereford—The new refuse treatment works, recently inaugurated, is described and illustrated. The plant consists of a rotary screen for separation of the dust, a tailings conveyor from which all metal, glass, etc., are picked, and a 3-cell back feed type Henan and Froude destructor, capable of reducing to well burnt, hard and innocuous clinker, free from organic matter, 28 tons of ordinary unscreened refuse during a period of 16 hours.—*Surv.*, 68:155 (Aug. 21), 1925. Abstracted by R. E. Thompson.

A German Water Purification Plant—This is a brief description of the new rapid sand filter plant of Stuttgart, Germany, consisting of intake canal from the Neckar River, raw water basin, chemical solution apparatus, mixing chamber, precipitation tank, eight circular rapid sand filters and chlorinating apparatus.

The Stuttgart plant is the most recent of the larger plants operating on river water and the results obtained will go far in helping to decide whether to continue with the use of expensive ground water plants or to turn to the use of water purification plants exclusively.—*Fire & Water Eng.*, 78:1237 (Dec. 2), 1925. Abstracted by H. R. Crohurst.

Administrative Contrasts in Water Supply and Air Pollution—Activities relative to water supply and air pollution are briefly discussed and compared, and the need of legislation relative to atmospheric pollution is emphasized.—W. W. Kelso, *Surv.*, 68:88 (July 24), 1925. Abstracted by R. E. Thompson.

London House Refuse—A conference was recently held of representatives of local authorities regarding the disposal and utilization of London refuse. Briefly, the proposals were to convert the refuse, directly it was received at the works, into fuel briquets either alone, or—if higher grade fuel was required—with addition of coal smudge. The conversion is effected by removing tins, crushing to fine powder, briqueting and passing through a bath of oil tar. It was suggested that the local authority deliver the refuse to a plant to be provided and run by a company, the company to dispose of all material received, and the local authority to pay an agreed sum for disposal.—*Surv.*, 68:240 (Sept. 18), 1925. Abstracted by R. E. Thompson.

Sewage Disposal at Singapore—Observations on sewage treatment during 1924 are given. The proportion of solids in suspension in the crude sewage is very high. After passing sedimentation chambers of the Imhoff tanks, the solid content is as high as average crude sewage in Great Britain. This renders operation of the filters difficult, choking occurring rapidly, and the suspended matter in the effluent places an undue load on humus tanks. Notwithstanding these difficulties the final effluent, discharged into the Singapore River, closely approximates the standard of the Royal Commission. An attempt to colonize the filters with achorutes viatiens failed, as the insects died within two days after arriving in Singapore. Scum from Imhoff tanks is treated by dumping direct into the digesting chambers of two of the tanks, clean water being added daily to dilute the thick accumulation. There is some doubt about the scum being wholly digested, but no offensive odors arise and the sludge appears normal and is without smell.—David B. McLay, *Surv.*, 68:183 (Aug. 28), 1925. Abstracted by R. E. Thompson.

New Water Supply of McAlester, Okla.—This illustrated article briefly describes the new water supply developed for McAlester by the construction of a dam, a 24″ pipe line and filtration plant.

Water is impounded in a large storage reservoir, by the construction of a 60′ masonry dam. Water is led by gravity through a 24″ cast iron conduit to the filtration plant of 4 m.g.d. capacity which consists of mixing chamber,

chemical storage room, concrete settling basins providing 6 hours' detention, filters, clear well and high lift pumps. A 2 m.g. clear water storage reservoir is provided to equalize pressures in the distribution system.—E. T. Archer, *Am. City*, 34:13 (Jan.), 1926. Abstracted by J. K. Hoskins.

Unsanitary Ground Waters in Missouri—Water supply conditions in Missouri are quite varied due to physical characteristics of the state which divide it into several distinct physiographic areas. North of the Missouri River and including two areas southwest of it, are the Interior Plains where the ground water is highly mineralized and where surface supplies are most common. The second area is south of the Missouri and is known as the Ozark Plateau. It includes all but a small portion in the extreme southeastern part. Water supplies here are obtained principally from wells drilled in rock. In the small section in the southeastern part of the state known as the Atlantic Coastal Plain, water supplies are obtained from comparatively shallow wells penetrating sand and gravel.

Of the 185 water supplies, 119 or 65 per cent are obtained from ground waters. The majority of the wells are in drilled rock giving a moderately hard water, those in sand giving water with excessive quantities of iron and carbon dioxide. Five municipalities receive water after treatment from lead mines.

Most epidemics have occurred from well supplies in limestone areas. Experience has necessitated rigid control over well drilling. Recommended specifications of the State Board of Health call for the submitting of borings to the State Geologist and for all casing to extend 10 feet in solid rock beyond all openings or soft rock. The sealing shall be done by natural cementing of drill cuttings, driving the casing into clay or shale, cement grout, lead packer or expanding rubber packer. A driller must forward a sample of the cuttings, and a drill record book to the State Geologist who furnishes with a copy of the well log.

Cities in the Plains District must spend approximately six times as much money to obtain an equivalent water supply as compared with the same size city in the Ozark section due to highly mineralized character of the ground water in the former section.—George W. Putnam, *Water Works Eng.*, 79:27 (Jan. 1), 1926. Abstracted by R. C. Beckett.

Public Health Work in Johannesburg—The writer believes that there is little or no public health necessity or justification for State-aided housing for Europeans in Johannesburg but that conditions of European housing in certain central poorer districts would be greatly improved by provisions in locations or villages, of adequate housing for natives, thus removing them from close residential association with poor whites.—Charles Porter, *Surv.*, 68:199 (Sept. 4), 1925. Abstracted by R. E. Thompson.

Ship Ventilation—This article discusses mechanical ventilation by means of electrical fans or blowers on ships. The best work is accomplished by means of a large centrifugal fan which propels or exhausts air through air trunks fitted in the beams and leading through the berths and other living spaces. Louvres are arranged in the air trunks to permit regulation of both quantity and direction of the air.

The efficiency of any system like this depends upon the number of changes of air which it will bring about in the living spaces supplied. The number of changes should be regulated by the degree to which carbon dioxide gas is present and the author discusses in the last few paragraphs the connection existing between the extent of the presence of carbon dioxide and the changes of air necessary in a living space.—*Plumber & J. of H. V. G. & San. Eng.*, 47:303 (Nov. 2), 1925.

Chlorophenol Tastes in Milwaukee Water Supply—It was found that a phenol manufacturing plant, located 14 miles from the city, and a local coke and gas plant were the chief sources of phenol compounds that combined with chlorine in city water and caused offensive tastes. The elimination of the wastes from the phenol plant and extension of the water intake 1½ miles further out in Lake Michigan, gave considerable relief but did not entirely remove the taste. Wherever practicable wastes that cause taste in presence of chlorine are kept out of city sewers and those that can not be taken care of in the plants are discharged into sanitary sewers and treated at the activated sludge plant. Experimental tests have shown that phenol-containing wastes mixed with large volumes of domestic sewage, lose their taste producing quality in passing through an activated sludge plant.

Discussion by C. M. Baker. Additional information is given regarding the tests made at

the Milwaukee activated sludge plant to destroy the taste producing powers of phenol wastes.—Russell W. Cunliffe, *J. Am. W. W. Assn.*, 14:423 (Nov.), 1925. Abstracted by H. B. Hommon.

Softening **Public Water Supplies**—A general discussion of the methods and chemicals used for softening water is given and tables are included that show the "Annual cost of hard water—Madison, Wisconsin"; the "First cost of municipal softening plants in America—October, 1915"; and the "Annual cost of operation and chemicals used—municipal softening plants, October, 1925."

Discussion by O. A. Hougen. The effects of hard water on certain industrial operations are described and additional data presented on the merits and disadvantages of the lime-soda ash and zeolite methods of water softening—John C. White, *J. Am. W. W. Assn.*, 14:406 (Nov.), 1925. Abstracted by H. B. Hommon.

The **Significance of the Colon Bacillus in Water Supplies**—In this article there is discussed the difficulty encountered in judging the safety of a water supply with any very great degree of accuracy. Chemical examination is referred to, but eliminated on account of reliance for detection of pollution being limited to those supplies where gross pollution is taking place. This narrows the examination to one of bacteriological nature and the writer states the ideal organism indicative of pollution must have somewhat the following characteristics: (1) It should occur universally and plentifully in human excreta; (2) It should have no other source than the human intestines (due to the fact that water-borne diseases are entirely those of human origin, the organisms being of intestinal nature and discharged in human feces); (3) It should live longer in water than the chief water-borne pathogens, but still die off fairly rapidly; (4) Its occurrence in water should bear a quantitative relation to the pollution received by the water; and (5) It should be readily discoverable by simple bacteriological methods. Unfortunately, this ideal organism has not been discovered and probably does not exist.

The three known groups approaching these qualifications are (1) the colon group of bacilli; (2) the sewage streptococci, and (3) the spore-forming anaerobes. As the colon bacillus has all the ideal qualities except the second one, it has been agreed upon as the index of contamination. It has been found that colon bacilli may be present in the intestines of the lower mammals and birds as well as reptiles, fish and even earth worms, but are more constant in the higher zoölogical types. Some authorities are quoted as evidence of the colon bacillus in some soils and in grain, but in much fewer numbers than found in the intestines of man.

As colon bacilli may be found in any water in its natural state if sufficient quantity is examined, the degree of pollution has been the basis upon which safety for human consumption has been judged. Reference is made to the disfavor with which the new Treasury Department Standard is looked upon by some American bacteriologists, as being more rigid than necessary for general purposes. The author feels that the significance of the colon group presence should be judged always with the nature of the particular water supply examined.—H. G. Furphy, *Health*, Australian Commonwealth Dept. of Health, Melbourne, 3:168 (Nov.), 1925. Abstracted by H. N. Old.

Prevention of Stream Pollution and Use of Lime—Pollution of streams from industrial or other sources is inevitable but the burden must be borne to a certain extent by the producer of the waste. In many cases some chemical or chemicals in combination can be used and always the cheapest is sought. Lime is one of these.

Among the industries whose wastes can be treated, partially at least, by lime are rubber reclaiming plants, tanneries, textile mills, distilleries, cocoanut products, strawboard, paper mills, gun wadding, roofing paper, banana oil, gas house, creameries, canneries, packing houses, steel and iron mills and sugar factories.

Lime usually produces a voluminous sludge and its use is attended by the necessity for a sedimentation tank. If this is so constructed as to be continuous in operation it is the more desirable. A Dorr thickener has been used in such situations with success. E. B. Besselievre, *Proc. 7th Annual Convention, Natl. Lime Assn.*, 1925. Abstracted by H. B. Foote.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D.*

Air Conditioning and Its Hospital Application—The physical conditions of the air, temperature, humidity, and air motion, exert certain definite, measurable physiological reactions in human beings. These reactions have been determined experimentally, using healthy adult subjects under various test conditions, by the U. S. Public Health Service and The U. S. Bureau of Mines coöperating with The American Society of Heating and Ventilating Engineers. Proper air control is a paramount need in the care of the sick. The need for mechanically purifying, heating and otherwise conditioning the air in occupied places is now well recognized. Hospital authorities are justified in investigating the advantages of mechanical installations over natural methods and the costs involved. Not only is a supply of outdoor air necessary, but it is essential that this be rendered sufficiently free from objectionable impurities, heated and cooled to a desirable temperature, and contain the proper amount of moisture. It is also important that the vitiated air be removed in an efficient way. While natural ventilation will prove generally satisfactory for particular types of hospital buildings in certain outlying districts, many of our larger hospitals are situated in noisy, smoky, and dusty cities and in climates where it is difficult to control the physical factors of the air during cold weather, unless we resort to mechanical methods. Air conditioning and ventilation are inseparable in modern ventilation.

The principal objects to be accomplished in conditioning the air are: First, the removal of solid or liquid matter, in the form of dust or spray, and the elimination of soluble gases and vapors including those of a disagreeable odor. Second, the addition to the air of sufficient moisture to give the desired degree of relative humidity in spaces to be ventilated. This process may be reversed in warm weather resulting in dehumidification and cooling. Cleansing and humidification are two important phases of the art of air conditioning. Whether the air introduced into hospital wards and rooms is contaminated or cleansed no doubt has an important bearing on the progress of certain diseases. Gases and dusts from automobiles, soot and smoke from chimneys, and disease-producing bacteria can be removed to a great extent by a properly designed air washer. Humidification is necessary in cold climates and seasons. On a zero day with an average relative humidity of 50 per cent outdoors, the air must be heated to about 75° F. Under this latter condition the relative humidity is reduced to the extremely low value of about 2 per cent. While this air is warm enough for comfort, it is enervating because of its high temperature and its great capacity for taking up moisture; complaints are, parching of the throat, considerable discomfort, and some authorities believe that it predisposes to respiratory diseases. The works of Huntington and Besson indicate that with ordinary temperatures high humidities are followed by lower mortality rates and vice versa. For ordinary temperatures the most probable optima appears to be between 50 and 60 per cent. In our climate such high humidities cannot be obtained indoors in winter without resorting to mechanical means.

The present conception, based on actual human experimental work, recognizes the influence of both the dry and wet-bulb temperatures, and also the velocity of the air. Within the "effective temperature scale" there lies a zone of comfort between 63° and 71° for healthy adults normally clothed and at rest. There is a temperature zone of minimum basal metabolism. This zone ranges from 75° to 83° effective temperature. Such conditions represent the optima for a minimum expenditure of bodily energies, and may be found desirable in the treatment of some diseases. Further studies along these lines must be made. Among specifications, the air distributions in wards should be uniform and thorough; objectionable

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drafts can and should be avoided. Artificial cooling in warm weather, obtained by the evaporation of water in the air washer, should be provided for.

While specific cost data are not available, heating, mechanical ventilation and air conditioning will approximate 17 per cent of the cost of the building. The space per occupant can be reduced by using a mechanical system. It is estimated by ventilating engineers that for a mechanically ventilated school in a cold climate the cost of the entire building is 15 per cent less than the cost of a building using window ventilation. The yearly expense of operating, heating and ventilating a building is perhaps slightly less when window ventilating is used than when a mechanical system is used, but considering the increased capacity for occupants in a mechanically ventilated space the cost per occupant will be materially higher in the window ventilated spaces. W. J. McConnell, *Mod. Hosp.*, *27*:2, 45–48 (Aug.), 1926.

Recent Results of Ventilation Investigations—The Lancet in an editorial reviews the recent investigations into the mooted subject of ventilation, especially those of the Medical Research Council by Leonard Hill and his colleagues, and, in America, by C. K. Drinker, Yaglou, and others. The knowledge already acquired has been already applied by the Industrial Fatigue Research Board with considerable success to factories, particularly steel smelting and humid weaving. "It is indeed now accepted that neither the chemical purity of the air nor the temperature (whether dry or wet bulb) is an accurate index of the physiological effect of the environment, but that in addition to both of these the rate of movement of the air must also be estimated." The effect of suitably arranged electric fans were studied in weaving sheds, among the conclusions being the following: (a) The cooling power of the air and bodily comfort of the operatives were considerably increased by the particular arrangement of fans adopted; (b) without fans, the cooling power of the air never reached the minimum standard considered necessary for workers engaged in sedentary occupations; (c) more powerful fans or a greater number of smaller fans were equally effective; (d) the output was apparently favorably affected by the use of fans. Investigations in more normal conditions of ventilating and heating as in shoe or engineering factories, or in schools, were made more recently by Dr. H. M. Vernon and Mr. T. Bedford of the Medical Research Council. ("A Physiological Study of the Ventilating and Heating in Certain Factories.") "Generally speaking, the authors have not found that expensive artificial ventilating systems installed even in new factories, produce the desired results, which may be summarized as keeping the air in such motion as to give a sensation of freshness and keeping the feet warm and the head cool. On the whole, natural systems of ventilation are regarded as preferable, being more pleasant and more healthy. The report contains a number of tables and diagrams embodying the details of a large number of observations carefully made. Natural ventilation by windows, particularly in summer, is pronounced to be good. Exhaust ventilation may be of some advantage, especially in winter, but it should not be at the floor level. The plenum system was found to compare disadvantageously with other systems. Heating is best effected through surfaces warmed to a fairly low temperature, and placed either in the floor or as near as possible to the floor. An ideal method would be to place hot-water pipes or radiators under the floor so as to heat the whole of the floor materials, as in the old Roman hypocaust. Thus we find the researches of modern science justifying the old-time usage—the open window and the heated floor—in contrast to the more expensive, complicated, but misdirected efforts of recent days. Evidence is quoted confirming the fact that even moderate differences in atmospheric conditions exert a definite influence on well-being as measured by lost time. The more does ventilation diverge from the optimum standards, whether on the side of excess or deficiency, the more does lost time for sickness increase."—*The Lancet*, July 3, 1926, p. 31.

The Future of Factory Medicine Service—No one with knowledge of modern industry could doubt the need for a medical service in factory life. The need existed at three stages: (1) At entrance—the present day hit-or-miss method of engaging new workers, a method which consisted in jamming pegs at holes until some were squeezed in somehow, was reflected in heavy economic losses and excessive accident and sickness rates; (2) throughout industrial life—to maintain healthy operatives; and (3) at convalescence—after cure of an illness a great

gap remained unfilled before a convalescent was ready to resume his place. "Already many up-to-date firms in this country were obtaining great financial returns by means of part-time or whole-time medical service. In the United States, action had in many cases reached a stage at which we could only wonder." The present service, with certifying factory surgeons was incomplete and unsatisfactory. His visits to the factory were generally regarded as a statutory nuisance for which statutory fees must be paid. If the Factories Bill, 1924, were to become law, each factory would then be permitted to select its own physician and extension of medical service would follow.—Edgar L. Collis, *Abst., Med. Off.*, July 24, 1926, p. 40.

Pulmonary Silicosis—Pulmonary silicosis is now a well recognized clinical and pathological entity. The condition is due to exposure for a series of years to the inhalation of fine particles of silica dust; the majority are little more than one micron in size and gain access to the finer ramifications of the air ducts and spaces. No condition comparable with silicosis has been described as following upon the inhalation of any other dust. Simple silicosis does not readily incapacitate those affected but in time, shortness of breath on exertion, persistent cough and strain on the heart develop. Death may be due to fibrosis of the lungs, but bronchitis, pneumonia and tuberculosis usually supervene.

Dusts of materials other than silica may produce other afflictions due to differences in size of particles, solubility and chemical nature, and are more apt to produce bronchitis and pneumonia. Silica dust alone predisposes to tuberculosis. Why it does so is not fully understood, but there is a fair agreement that its action is a chemical one in which colloidal silica, a definite tissue poison, is found. Phthisis is the term applied to this condition, although the presence of silica is not a necessary feature in phthisis. The mortality rate for phthisis in the silica group always exhibits its highest incidence later in life, between the ages of 55 and 64, than does ordinary pulmonary tuberculosis.

Thus, coal miners with a low death rate from phthisis, show a maximum incidence between ages 55 and 64, the same as in silicosis. Even one coal field like Lancashire shows a rate of bronchitis, pneumonia and phthisis 2 to 3 times as high as another, like Nottingham. Tuberculous silicosis is occurring among coal miners, but only among a small group employed in driving headings, and doing such work in silica rocks.

The mortality from Bright's disease is likewise high in those exposed to silica. There is some evidence from animal experiments that silica in the lungs is slowly dissolved, passes into the blood stream and is eliminated by the kidneys. Fibrosis of the kidneys is an end result.

A peculiarity is that those who come in contact with tuberculous silicotics do not appear to contract tuberculosis from such exposure. In the Sixteenth Century, Agricola wrote of women in the Carpathian mountains who, owing to the high death rate among the miners from this cause, married seven times. Thackrah similarly states that there were in the villages of Arkendale, in the lead mining districts, not less than 30 widows under 30 years of age. Greenhow, in 1858, said that there was a larger proportion of widows in the lead mining district in England than any other place in the kingdom, while Peacock in 1864 stated that silicosis was unusually prevalent among tin miners. Dr. Haldane noted this excessive mortality among tin miners in 1902–1904, but that the wives and children occupying the same rooms as the affected men who were expectorating sputum loaded with tubercule bacilli never seemed to be affected. Similar conditions have been found to exist among the ganister workers at Wortley, among the flint-knappers at Brandon, the granite-cutters of Aberdeen, the masons of Grinshill and the gritstone workers of Derbyshire.

"Dr. Turner has told me that his inquiries in South Africa into the occurence of phthisis in the native kralls have failed to establish that natives returning home with dust phthisis from the gold mines disseminate the disease among the tribes. While Hoffman in 1922 after describing the extraordinary amount of phthisis among American granite cutters writes of their wives that 'the relative frequency of pulmonary tuberculosis among them is considerably less than that which would be theoretically assumed to occur.'" Edgar L. Collis, *J. State Med.*, 24:7, 401–404 (July), 1926.

New Law Pertaining to Occupational Diseases—Industries handling toxic substances are particularly covered. Sanitary equipment and supplies, and a complete medical service shall be installed. No charge is to be made for the use of the equipment. "The heads of in-

dustries will entrust the regular inspection of employes and the sanitary equipment of their factories to physicians approved by the minister of labor." A register of names of workmen, absence on account of sickness, dates and duration shall be kept. "The physicians will inspect the sanitary conditions of the factory equipment at least once a month. They will question (without compelling them to leave their posts) those workmen who appear to be failing in health. After each of their inspections, the physicians will make a written report of observations, in special registers, but will exclude information involving professional secrecy." "The employers will, through their physicians, institute a general revision of the personnel of their establishments whenever they are requested to do so by the chief inspector of mines, or by the medical inspector of labor. The employers or managers will pay all the costs of medical inspections, and deductions will not be made from the wages of workmen for loss of time incurred by such inspections. Records will be kept for at least 5 years. The registers will be open to examination by government inspectors charged with the execution of the law."

The law contains also provisions pertaining to general hygiene and industrial organization. Provisions for obtaining samples of fumes and gases shall be provided as well as devices to carry off fumes, to dilute gases and, as far as possible, to effect the condensation of harmful materials.— Belgium Letter, *Jour. A. M. A.*, 86:21, 1638 (May), 1926.

"Haff Sickness" Explained—For a couple of years reports of a peculiar sickness of fishermen in the German Baltic area have been mentioned in the press and elsewhere. The affliction was proving ruinous to the industry and has been eliminated virtually by government fiat. The following is taken from *Science News*, July 30, 1926, p. xii: The stretch of shallow water along the southern end of the Baltic Sea is known as "the Haff." For a little over two years, fishermen in this area have been suffering from a very painful and in some cases a fatal disease. Paralysis of the legs was a feature as well as other disturbances indicating arsenic poisoning. A peculiar feature was that the victims were always attacked while out in their boats, generally in the early morning and while the mists hung over the waters. The symptoms subsided after spending a few days on shore. It was thought at first to be an epidemic of some germ disease. Then, that it was due to the eating of spoiled fish or eels. Investigators found that there was something in the water that rose in the morning mists and caused the disease by poisoning the air. This poison was found to be arsenic in an altered form, caused by the discharge into the water of great quantities of factory wastes from cities along the shore. Small aquatic organisms converted the arsenic into a gaseous form, inhaled by the fishermen at their work. The government's order to change to other materials containing a lower percentage of arsenic virtually ended "Haff sickness" within a few months.

Warning Concerning Shell-Rimmed Glasses—The M. H. Harris Co., oculists and opticians, with numerous offices in New York, Brooklyn and Newark call attention by personal letter to the AMERICAN JOURNAL OF PUBLIC HEALTH of the danger connected with the wearing of shell-rimmed glasses, stating that 99 per cent of all of them "are made of ingredients that are chemically and actually highly inflammable, and the wearing of the same involves great danger to smokers and those persons who are likely to come in close contact with fire or any other agent likely to cause ignition." Such accidents, the letter states, have been reported many times in the past 10 years. An attached clipping refers to the accident to Miss Ethel Dale, the dancer, in which she received facial burns from the ignition of her shell-rimmed glasses when lighting a cigarette, as reported in the *Daily Mirror* of May 27, and the *New York Telegram* of May 28.

Rock Dust Material for Coal Mines Should Be Free of Silica—Limestone, dolomite, and gypsum are found to contain no free silica or at least very low percentages, and are, therefore, suitable materials for the preparation of pulverized rock dust in the prevention of explosions in coal mines. "With respect to shales, mill tailings, adobe and clays, many of the samples tested were found to contain above 25 per cent of free silica and are considered unsuited for rock dusting purposes. Those operators who may contemplate the use of shale, clay or adobe for rock dusting, should have the material examined in order to determine whether it is suitable."—Circular 6008, *U. S. Bur. of Mines*, May, 1926.

FOOD AND DRUGS

WALTER S. FRISBIE

Report of Committee on Uniform Standard Milk Ordinance, Conference of State and Territorial Health Officers, 1926—A committee of 4 members, appointed by the 1925 Conference of State and Territorial Health Officers, was instructed to make a careful study of the so-called standard milk ordinance of the United States Public Health Service and submit a report to the 1926 conference. The committee report comments on the advocacy of the so-called standard milk ordinance by the Public Health Service and is in accord with the general conclusions reached by Leslie C. Frank, Sanitary Engineer of the United States Public Health Service, in his paper presented at the American Health Congress at Atlantic City.

The committee recommends, among other requirements, a provision in the standard milk ordinance for four grades of milk—Grade A pasteurized, Grade B pasteurized, Grade C pasteurized, and Grade A raw milk. The committee made inquiries of each of the 10 states in which the so-called standard milk ordinance has already been adopted and the report from each one of these states is that the operation of the ordinance is satisfactory and only one modification was suggested, *i.e.*, that it should be made more adaptable to smaller communities which do not have laboratories.

It is believed that the ordinance is so framed as to be attractive to the majority of types of cities, noting, however, that in none of the states in which it has been adopted is there a city of 500,000 population or over. Whether the ordinance will prove attractive to the larger cities, suggestion is made that the principal problem with which the state officials have to deal is not that of the largest cities, since in general these have inaugurated milk sanitary laws equal if not better than the average in the state as a whole.

About 40 proposed modifications of the ordinance were submitted to the committee which reports that with few exceptions none of them will affect the operation of the standard ordinance or lead to disagreement. Modifications which the committee feels may lead to disagreement are: The proposed modifications in reference to the pasteurization temperature. The committee recommends that the ordinance should retain the pasteurization temperature of 145° C. and not 142° as proposed.

The second modification is the proposal that chlorine sterilization should be accepted as being as effective as sterilization with steam. The committee believes that this has not been proven and as the issue is a debatable one it would be wise to exclude this modification.

The third modification is the proposal to accept the reductase test in place of the bacterial count. The committee feels this is another debatable issue and recommends that the proposed modification be included in the standard ordinance and that the states and cities opposing it may exclude it as a local adaptation of the ordinance.

The committee, in conclusion, points out that the standard ordinance enjoins "minimum requirements" and recommends its adoption, modified as suggested, by the Conference of State and Territorial Health Officers.—*Pub. Health Rep.*, 41:31, 1573, July 30, 1926.

Food Poisoning from a Streptococcus in Cheese—The authors of this paper have studied two outbreaks of food poisoning attributed to cheese—one at Biddeford, Maine, and the other causing an outbreak of 22 cases at Kansas City, Kansas. Cheese alleged to have caused the first outbreak was an imported Albanian cheese, and the second was an American cheddar cheese manufactured in Wisconsin. Reports of attending physicians in both cases are included. A table of the aerobic counts made from plate cultures on dextrose agar is given. Suitable colonies were transferred to dextrose agar slants and smears prepared for microscopic examination. Cocci were the only group from 100 colonies found. Five proved to be members of the *Streptococcus lactis* type. Organisms of the paratyphoid-enteritis group, commonly found in food poisoning cases, were not found. The cocci type of organism was isolated and used for feeding experiments, without effect so far as white rats, rabbits, guinea pigs and sheep were concerned. Dis-

turbance was produced in the case of dogs, and cats showed positive results. In these experiments milk was used as the culture medium.

Further investigations failed to produce sickness in the experimental animals where substances other than milk were used as culture mediums. Description of the organism is given, together with cultural characteristics and biochemical features. It was found that in attempting destruction of the organisms 142° F. had some effect, but for complete sterilization 145° F. for 30 minutes was found necessary. The organism has not been definitely identified with any well known species, although it has much in common with ordinary lactic types used in the preparation of "starters." It was suggested that this organism might be carried as a contamination of such starters without easily detecting its character.—B. A. Linden, W. R. Turner and Charles Thom, *Pub. Health Rep.*, 41:32, 1647, Aug. 6, 1926.

Action of Light on Cod Liver Oil—Noting that a sample of cod liver oil on standing 6 months in a laboratory had lost its fluorescence, the author undertook to determine the possible cause of this phenomena which was assumed to be one of three that: (1) the oil had reacted with atmospheric gases causing oxidation; (2) the effect was due to variation in temperature; and (3) that the effect was due to absorption by the oil of heat, light, or ultraviolet radiations. Samples of brightly fluorescent cod liver oil were sealed in tubes and exposed to the sunshine, one tube being covered with rubber tubing to protect it from the sun's rays. The uncovered sample lost fluorescence completely in 5 days. Control was still fluorescent. Further experiments indicated that loss of fluorescence was caused by sunshine to which phenomenon the term, "delumination," has been applied. It was also found that "delumination" has also been produced by a carbon arc lamp, a mercury vapor lamp and a fullolite gas filled lamp. The required range of time was from 10 hours in the summer sunshine to 5 days under the gas filled lamp at a distance of 5 cm.

The effect of "delumination" on the vitamin content of the oil was also investigated. It was found by means of chemical reaction with arsenic chloride that this test was negative after exposure of the cod liver oil to the sun's rays. It was found, however, that the negative reaction for vitamin A was reached before complete loss of fluorescence was obtained. This was supported further by the study of the absorption spectra of "deluminated" oil and oil which had been deluminated just sufficient to destroy the vitamin A reaction. The chemical determinations were supplemented by animal feeding experiments which confirmed the former test. It was further found that fully "deluminated" oil kept for some months in the dark slowly regained much of its fluorescence but that vitamin A appeared permanently destroyed.

This paper emphasizes the fact that light is a variable factor in all quantitative experiments concerning the growth promoting properties of cod liver oil, and calls attention to the unusual action of cod liver oil to light, a partly reversible reaction.—P. R. Peacock, *Lancet*, 7:2, 328, Aug. 14, 1926.

Destruction of Vitamin A in Milk by Ultra-Violet Light—The authors point out that while irradiation of milk enhances its nutritive value in respect to vitamin D content, it materially decreases its vitamin A content. Chicks were used as experimental animals. Learning from previous experiments that chicks treated with ultraviolet light and fed with white corn and tankage, when supplied with vitamin A, make satisfactory growth, accordingly 2 lots of chicks were irradiated with a quartz mercury vapor lamp for 15 minutes per day. The same ration was given to both lots except that the 5 c.c. of fresh whole milk supplied in one lot was irradiated and in the other non-irradiated. The milk in a sheet iron pan was irradiated by subjecting to the rays of the quartz mercury vapor lamp placed 18 to 20 inches above the surface, agitating the milk. At the end of 7 weeks the chicks which had the non-irradiated milk showed no vitamin A deficiency. One chick remained in the other lot apparently able to survive the unfavorable conditions, the other chicks having died with vitamin A deficiency. This experiment agrees with the findings of Emmett and Peacock (*J. Biol. Chem.*, 56:679, 1923) who give a full report of the occurrence of ophthalmia in chicks suffering from vitamin A deficiency.—R. W. Titus, J. S. Hughes, W. R. Hinshaw and J. B. Fitch, *Ind. & Eng. Chem.*, 18:2, 843, Aug., 1926.

CHILD HYGIENE

MERRILL E. CHAMPION, M.D.

Chronic Fatigue in the School Child—A Psycho-physiologic Study—(Preliminary Report) Fatigue is a condition most intimately related to everyday life, but as common as it is the nature of fatigue is unknown. The trend of civilization toward excessive nervous and emotional habits of living affecting man already in early life makes this a problem of practical and vital importance. Since the term fatigue is so often misused the following clinical working definition is offered: Chronic fatigue is a psycho-physiological syndrome of more than three months duration, the state of sub-efficiency manifesting itself in four ways: (1) feelings of fatigue; (2) actual decrease in the individual's average mental achievement; (3) actual decrease in the individual's average physical strength and endurance; and (4) emotional unbalance.

Why is it that the child is so highly susceptible to chronic fatigue? It is because (1) he lacks adequate preparation for his school work; (2) his inhibitory and coördinating mechanism are relatively poorly developed; and (3) his emotional reactions are easily rendered abnormal.

Experimental work was carried out to establish: (1) Whether objective tests are of use in the diagnosis of chronic sub-efficiency of chronic fatigue and (2) whether the answers to the questionnaires by the child, the parent, the class room teacher and the gymnasium teacher give information sufficiently reliable to warrant their use in functional diagnosis.

The following conclusions are drawn: (1) Neither the amount nor the degree of fatigue can be determined by objective tests; (2) a diagnosis of chronic fatigue is justifiable in the presence of feelings of fatigue and one of the other three factors mentioned in the definition of chronic fatigue; (3) the greater number of positive answers in the questionnaires of the abnormal group of children justifies the use of questionnaires in the diagnosis of chronic sub-efficiency.

A program of prevention of chronic disease is offered:

1. Knowledge of family history
2. Recognition of inferior types of Neuropathy-Asthenia, etc.
3. Establishment of adequate physical and mental health habits in infancy
4. Physical exercises (especially corrective) in infancy and preschool age
5. Recognize all causes responsible for chronic fatigue
6. Improve general health
7. Prevent repeated attacks of acute fatigue due to
   Emotional overstrain;
   organic disease; and
   inadequate health habits
8. Equalize the physiological and chronological ages
9. Public School System:
   1. Substitute the dynamic for the static
   2. Substitute the individual for the lock-step
   3. More special classes
   4. Attention to health of teacher
   5. Improved room facilities
   6. Vocational selection and guidance
   7. Conservation of special senses, ears, eyes, feet
   8. Education in technic of mental work (rhythm, rate, use of instruments)
   9. Recesses and rests in school
   10. Supply necessary motive and interest, based upon laws of growth and development
   11. Decrease nervous tensions
   12. Physical education for all children every day.—Max Seham, M.D., *Boston M. & S. J.*, Apr. 29, 1926.

Fitting Physical Education into the School Program—There are in some school systems adjustments still to be made in fitting in the physical education program. These adjustments are in regard to the relation of the physical director to executives, the programs and the plan of the instruction, whether the latter be the Graded, the Departmental, or the Platoon System. In part day sessions, the amount of physical education may have to be cut but should not be eliminated.

The essentials in methods of procedure are: (1) To know the work; (2) to get it across; (3) to plan and outline it definitely for the teachers taking into consideration the amount of time allotted for it in the daily schedule.

The supervisor's time in the class room should be used in "presenting new material" and in observation of the teachers' work. In the high school, attention should be given to grading of classes that the work may be progressive. Size of classes should average according to total registration. The work should to an extent be suited to individual limitations of pupils. Some leeway for excuses from participation in a full program is necessary.

A uniform for gymnasium wear is advisable. It is more hygienic, more comfortable, and less expensive.

Credit for physical education courses in high schools should be considered when "facilities are adequate, time is sufficient, and teachers are well trained." All special supervisors whose work can be at all correlated with physical education should be encouraged to do so.

Factors hindering the program will probably in time be overcome; this will facilitate a better development of the program because teachers of physical education will willingly stay on their jobs more than one year.—Mary M. Hefferman, *Am. Phys. Ed. Rev.*, June, 1926.

Recent Trend of Puerperal Mortality—Examination of the Census Bureau's records of the mortality from abnormalities associated with childbearing in 9 states (including Connecticut, District of Columbia, Maine, Michigan, New Hampshire, New York, Vermont) where there has been admittedly much improvement in maternity service in the past decade, shows discouragingly little change during this period. There appears a slight increase in the death rate for puerperal conditions as reckoned against births in a constant area. The death rate from puerperal sepsis and puerperal eclampsia, which account for more than one half of our maternal deaths, has remained unchanged. If with all recent effort along these lines, improvement fails to show, what is the trouble? Or is it reasonable to expect results in so short a period? The *Bulletin* in this connection asks some other searching questions. What could have been expected of the maternity work which was instituted with such fervor and zeal 10 years ago? Was it founded upon sound principles, were its aims realizable, and was there a program sufficiently comprehensive to affect the vast number of maternity cases which occur annually in the area under survey? Or, have new factors intervened to offset the work of boards of health and of private agencies? Has the increased proportion of hospitalized cases been accompanied by more septic complications? *Statistical Bull.*, Metropolitan Life Ins. Co., July, 1926.

Trials of a Little Child: Not Giving Him Time—To unduly hurry a child, physically or mentally, is an offense of which many adults are guilty. Everyone, the child as well as the adult, has a certain rate at which he can work most effectively and with the least mental strain. This rate increases only with practice, familiarity with the process, and a clear mental picture of the task. Children have had less experience in even simple activities than adults, yet adults are annoyed at their slowness and clumsiness. This annoyance in the adult is attributed to impatience, a feeling of superiority, and the self-satisfaction which comes from doing well what another does poorly. These lead him to do for the child acts which the child should perform himself, however clumsily. For the child must learn to do by doing. Some of the results of hastening the child beyond his ability are discouragement, an unwillingness to try again, and the habits of doing things superficially. It is impossible to force a child, physically or mentally, without missing important steps in his development, and in the formation of his character.—*Maternity & Child Welfare*, London, June, 1926.

Feeding of the New-born Infant from the Obstetrician's Point of View—Dr. Irving discusses most practically "who shall feed the baby" and remarks: "In the hospital with which I am connected it is the consensus of opinion that the mother should feed the baby. Since the mother is admittedly the obstetrician's patient, it follows by a simple process of reasoning that he should advise her how this may be brought about. The chief reasons why a baby fails to gain on the breast, given a normal infant, are because the milk is not good enough, or because the baby does not get enough of it. The cases in which the milk is not good enough are uncommon compared with those in which the nursling does not obtain a sufficient supply."

Dr. Irving advocates manual stripping of the breast or the use of the electric pump to remove the residual milk from the breasts in cases where the baby does not make satisfactory progress and there is a suspicion that the breasts are not being completely emptied: "The

chief pitfall to avoid is the early addition of cow's milk. Putting the baby on a formula before it has had a chance to show what it can do on the breast has dried up the maternal milk supply more frequently than any other one cause." Frederick C. Irving, M.D., *Boston M. & S. J.*, June 24, 1926.

Magazine of Children Diseases—A new magazine dealing with children's diseases appears on the horizon—"Archives of Disease in Childhood" published by the British Medical Association House, London. Sir Thomas Barlow in his interesting introduction makes a good case for pediatrics "as an integral part of general medicine," while granting that "for convenience of reference it deserves a notable place amongst special branches."

Dr. Barlow reviews in some detail causes of rickets, present treatment and preventive measures. He emphasizes the importance of proper diet for the pregnant mother as a preventive, a factor too often overlooked. In rachitic infants we must also bear in mind always other disease factors such as hereditary syphilis, cretinism, infantile scurvy and intercurrent acute illness. The feeding factor is of course of utmost importance and we are reminded of the very possible injurious custom of too early addition of carbohydrates to the infant's food. Budin's contention in regard to infant feeding in favor of undiluted cow's milk in small amounts at more frequent intervals is worth careful consideration.

Dr. Barlow summarizes briefly the more recent facts and theories relative to maternal syphilis, artificial infant feeding, scurvy and hypertrophic stenosis of the pyloris, and emphasizes the great importance of the work done on rheumatism in children, advances in orthopedic surgery, and the great future ahead in the subject of immunization.

The Father's Share—The comparative newness of the maternal and child welfare movement may be some excuse for our rather narrow preoccupation with mothers and children to the exclusion largely of consideration of the fathers and their tremendously important part along these lines. Education of mothers in the care of themselves and their children has progressed by leaps and bounds, but have the fathers kept up and have we made much effort to educate *them?* It would seem not, as fathers are still often found who are prejudiced against the advice the mothers receive at the maternity centers (as true in the United States as in England). In the work reported from Kensington, methods of interesting the fathers are given in some detail which resulted in 1921 in the establishment of a father's council, the first of its kind in England. Its objects were:

1. To bring home to fathers the responsibility which rests upon them in giving the child a proper start in life
2. To advance the interests of the center
3. To raise funds for the center by means of entertainments and so forth

The results showed that fathers "when once tackled, not only become keen, but want to act as disciples of hygiene and to influence other men and women."—Dr. James Fenton, *Maternity and Child Welfare* (London), June, 1926.

Toronto's Forest Schools—The Forest Schools of Toronto seem to have carried the idea of the open air class room to the nth degree. One was opened in 1912 under the Board of Education, a second followed in 1914. First attendance was 50—total attendance at present 360. The administration has been transferred to the Department of Health.

Each of the city's 8 health districts is allotted the privilege of a definite representation. These are selected by the district medical officer and public health nurses. Children are chosen because of malnutrition, tuberculosis contact, and chorea. The schools are carried on entirely in open air. The program reads like an all-day picnic with a certain amount of educational material adapted to their handicapped condition. It consists of sleep and play, eating and study out of doors, nurses' visits daily and doctor and dentist regularly. At 4:30 o'clock they are dismissed.

Miss Dove reports interesting individual improvement and in general "great progress."—Annie G. Dove, R.N., *Nation's Health*, May 15, 1926.

Dental Hygiene Exhibit of the Massachusetts Department of Public Health—To be consistent with its new dental policy, which states that it will "Furnish information concerning the relation of nutrition to tooth development to the public," the Massachusetts Department of Public Health has planned and developed a new dental hygiene exhibit. This new exhibit consists of 2 factories—The Well Built Tooth Factory and The Poor Food Tooth Factory, which, with their little carts

of supplies, their attractive or barren yards, different departments and final shipping of teeth to "Jawville," tell in a vivid and graphic way the story of what is happening in the mouth and jaws of every child from 2 to 6 years, according to the kind of diet that the child is getting. We must get the message to our mothers and children that strong teeth are built, not brushed, and how better could this be done than by a toy factory with one side removed so that one can see the whole process revealed.—*J. Am. Dental Assn.*, Aug., 1926.

The **Importance of Early Years**—The environment of the young child is made up largely of adult personalities. His conduct is simply his reaction to his environment. Many personality twists in early childhood are due to relationships with parents or adults who do not understand the child, whose method of training is but a reflection on their own emotional instability, or who provide an atmosphere of disharmony and discord in the home. The most important function of a mental hygiene program for these years, therefore, is to educate parents and others who have the responsibility of caring for children.

The first step in this education is to impress upon the mind of parent and teacher that the child has a mental life; instincts and emotions, a hunger for self-expression which is constantly infringing upon a code of laws and customs of which he has no understanding, plans, hopes, ambitions, doubts, fears, misgivings, joys and sorrows. The child's conduct is largely a struggle between his instinctive strivings and the inhibitions set up by his environment. These strivings, which have as their object the preservation of his own physical body and the development of his own personality, have been expressed as follows:

1. Bodily pleasure, such as desire for food, drink, and creature comforts, and bodily sensations of a pleasant nature
2. Intellectual curiosity; desire for new experience
3. A lust for power and for exhibiting it
4. A lust for recognition
5. Desire for security

The younger a child the more closely his reactions to his environment approach the instinctive level.

The atmosphere of the home has an important influence on the developing personality of the child. A recent study of problem children coming from friction homes has shown the principal causes of friction to be: economic, the inability or unwillingness of the father to provide adequately for the family; intellectual gulfs; vice or bad habits on the part of one or both parents; neurotic traits and emotional instability; mental and physical disease; interference of relatives, and marked difference in the ages of parents. Under these conditions the child early learns that the house is divided against itself. Love of approbation as a factor in child training is thus neutralized, for what one parent disapproves the other invariably approves. When we remember that imitation and suggestion are most potent at this period of life, it is not surprising that the atmosphere created in such a home fails to develop the desired stability that is so essential to meet the problems of the world outside. The friction home is the workshop which specializes in turning out children who, during the first 6 years of life fail to develop habits and inhibitions which are so essential to happiness and efficiency in later life.

So it may be seen there are wonderful possibilities and definite limitations to what mental hygiene can accomplish, depending to a very large extent, not so much on the patient, who is simply the product of an unhealthy environment, but upon the coöperation, interest, and to a lesser degree, the intelligence of the personalities with whom the child comes in contact.—Douglas A. Thom, M.D., *World's Health*, Aug., 1926.

The Prophylactic Use of Measles Convalescent Serum—Conclusions:

The injection of 6 cc. of convalescent serum or plasma into a child under 3 years of age and from 6 to 10 cc. for a child over that age who has been exposed for less than 5 days to measles is sufficient, as a rule, to prevent infection. If it does not, it almost certainly so modifies the attack that it is very mild and is not likely to lead to complications.

The prompt use of the serum will prevent serious outbreaks of measles from developing in institutions and so prevent the development of complicating pneumonias.

It would be of extreme value to have a supply on hand to prevent outbreaks of measles among troops, such as occurred so disastrously in the late war.

The serum gives immunity for only two weeks to one month. In the modified cases there is lasting immunity.

The serum gives the greatest accumulation of antibody shortly after the convalescence of the patient. At the end of three months, the antibodies are still abundant but probably less in amount.

In order that the use of convalescent measles plasma may become general, some plan must be devised by which the supply will be constant.

It would seem that if every physician equipped himself with the very simple apparatus necessary for obtaining the blood, and if the attempt was made to draw between 10 and 25 cc. of blood from every case seen in children and larger amounts in adults, he would have enough for the majority of exposures in his practice, the average dose being only 5 cc. Institutional needs must be met by other methods, such as the one to which the New York City Department of Health had recourse. The department of health has a standing offer to send a physician to any convalescent adult who has given consent to have his blood drawn. After the blood is withdrawn, a fair proportion is kept for the use of the physician who referred the case to the department.—William H. Park, M.D.; Rowland G. Freeman, Jr., M.D.; *Jour. A. M. A.*, Aug. 21, 1926.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN *

Education and Publicity Headquarters at Buffalo—As usual the Section will maintain a headquarters at the Hotel Statler to facilitate acquaintance among those interested. Consultations will be arranged with specialists in various forms of education and publicity. The latest and the best of books and pamphlets on methods will be there for examination. Orders will be taken at the Association book display. Many samples of helpful technical publications not generally known to health workers will be displayed so that copies may be supplied upon request. Samples of health education and publicity printed matter, press releases, etc., supplied upon request by health agencies will be shown. There will be generous displays of choice specimens of materials used by health agencies in several countries. What have you to offer?

Will You Help at Buffalo?—The large attendance expected at Buffalo, the extensive use that will be made of Publicity Section Headquarters and the activities of the Section call for considerable service from members of the Section and others interested in education and publicity. Please indicate promptly after your arrival what hours you can give to this service. It would be better still to write the secretary in advance. It will be especially important this year to arrive early. Monday will be the best time to examine the materials at the Section headquarters. The first round table luncheon is booked for Monday noon. And, most important of all, the annual dinner of the Section is announced for Monday night.

How Would You Do It?—"If I were editor of the Education and Publicity department of the AMERICAN JOURNAL OF PUBLIC HEALTH I would . . ."

The blank space is left to be filled out by those to be present at the dinner-business session of the Education and Publicity Section, Monday night, October 11, at Buffalo. Since the sole purpose of this department is to be of service to its readers this feature of the Buffalo meeting will be of particular importance.

What Display Material May Be Used in the Schools?—What posters and placards supplied by health organizations and other sources are sound from the standpoint of the public health worker? Which of them do not clash with the teachings of the art department? Can they be read across the school room without eye strain? What material is adapted to specific grades and may be useless in many other grades? How much of it is sound in the judgment of school health educators? Is it better to use anything which is available since

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York City.

there is so little that seems to meet the tests? Or is it wiser to use only such material as can be approved on the basis of present day educational standards? Shall we continue to use commercial advertising posters, some of which are of a much higher grade than most of those provided by health agencies? Shall we use in the class room posters naming specific products or firms?

These are questions being asked by many thoughtful public health workers as they seek to coöperate with teachers in elementary and higher schools. Some of the questions will be faced frankly at Buffalo in October in a joint session of the Child Hygiene Section and the Education and Publicity Section. The discussion will center about selected display material gathered from many sources. Several school and health workers will lead the discussion with full opportunity for the audience to participate.

How to Evaluate Health Education Materials—In preparation for the joint session at Buffalo in October of the Child Hygiene and Education and Publicity Sections of the A.P.H.A., several small conferences have been held to consider the problems involved in judging educational materials. Miss M. Elizabeth Barker, director of health education, Wittenberg College, Springfield, Ohio, who participated in these discussions, has prepared an excellent summary of the problem from the point of view of the teacher, as follows:

The classes of material for use in health education may be divided into four general types according to its use or purpose: (1) Purely educational materials; (2) interest arousing devices; (3) device for developing attitudes or ideals; (4) commercial advertising built around health teaching.

"In judging teaching materials such as posters, charts, models, devices, etc., in health education there are 4 fundamental points:

"Is the material: (1) Scientifically accurate; (2) pedagogically sound; (3) psychologically correct; (4) does it fit the need?

"Further analysis of the above points is as follows:

1. Scientific accuracy
   Our illustrative material must be carefully scrutinized from this angle. Care should be taken to eliminate half-truths, mis-statements and misleading statements.
2. Desired teaching content
   It should include one or all of the following:
   (a) Facts which fit the child's need and experiences
   (b) Interest for the child
   (c) Concomitant learnings in the form of developing attitudes and ideals or conduct changing
3. Psychology
   All psychology teaches that *positive* rather than *negative* teaching is most desirable. There must be *satisfaction* in order to get the results desired.
4. Pedagogy
   The illustrative teaching material has no value unless it is: (a) Stimulating to thought and action; (b) growth promoting.
   In other words, it must have a 'leading on' quality which presupposes 'worthwhileness.'
5. Art
   The material must be: (a) Pleasing; (b) attractive; (c) good form.
   If for no other reason 90 per cent of the illustrative material now available would be thrown out because of these immediate points. So much of the material is ugly, unattractive, vulgar, pointless, valueless, senseless!
6. Adaptability
   In purchasing material or using it one must ask: (a) What age groups can best use it; (b) does it *best* satisfy the purpose?

"The best teaching devices of my own experience are those which are so fundamental they may be used from kindergarten to college, and include laboratory and field experiences.

"Children are not passive. They most appreciate those things which are within their own experience. Unless the material does come within their experience it has little value.

"Perhaps there is another point which needs some consideration and that is *cost*. We are very prone to economize in our health work for some reason or other and because commercial advertisers have found it a profitable field there is much worthless, deleterious material on the market. Even when the advertising material is good, it is a question in my mind whether it should be used."

What Are We to Do About It?—"What of adult groups?" says *Nation's Health*. "Their schooling period is over. Such progress as is made with its members must be along the lines of positive objective demonstration rather than those of detailed and scientific teaching.

"Insistent attention should be directed to the correction of errors in diet and personal habits. Increased daily water intake up to 6 or 8 glasses, the inclusion of fruits and coarse vegetables in the diet, regular daily attention to the bowels, exercise in fresh air, and adequate sleep are the foundation stones upon which long lives will be built. Beyond these few simple rules there is little need for further health education of adults. Refinements of method and detail only serve to complicate the problem and until these fundamentals are better understood and more generally appreciated, more extended teaching will be of little avail."—Health Education of Adults, in *Nation's Health*. Oct., 1925.

Do we agree with this editorial opinion? If so, are we carrying on futile health education activities? Is this a subject for discussion at Buffalo in October?

Science Service—To make science a part of the thought stream of the general public is the hope of Science Service. In order that the largest number of people may be reached with the least effort Science Service operates in part as a newspaper syndicate. It is estimated that one-fifth to one-tenth of the total population of the United States is reached by the various services and products of Science Service.

The principal newspaper service, the Daily Science News Bulletin, is used by newspapers with a total circulation of over 2,000,000. The annual output of Science Service is over a million and a third words.

Fourteen different features prepared and distributed by Science Service are now being used by newspapers throughout the world. These include: Current Radio, daily; A Dog's Life, weekly; Isn't It Odd, weekly; Living Inventions, daily; Nature's Notebook, daily; Science for Home and School, weekly; Science News Bulletin, daily; Science Shorts, weekly; Star Map, monthly; telegraphic science specials, daily; Test Yourself, daily; Ventures Into Science, daily; Why the Weather, daily; Illustrated Features, weekly.

Due to the widespread interest in health and medical progress and the importance of the field of health and medicine to the general public, approximately one-fifth of the output of Science Service news is devoted to medicine, physiology, hygiene, and other phases of the health field.

The Daily Science News Bulletin is a daily mail service issued from Washington. Correspondents from all parts of the world contribute to it and much of the news is brought in by telegraph and cable as well as by mail. In addition to the daily mail bulletin service important events, such as the recent American Health Congress at Atlantic City, are covered for leading newspapers by daily telegraphic dispatches.

Science Service is interested in obtaining from those working in the field of public health information about their activities, reports and researches. It urges that investigators and administrators send such information to Science Service without waiting for specific request to be made to them.

Science Service will also welcome coöperation from those interested in public health in placing its product in the newspapers of the cities which at present do not use it. Science Service will be pleased to tell those interested about the services and coöperate in presenting samples and prices to newspapers.

A weekly publication, the Science News-Letter, is also issued by Science Service, available for subscription by individuals, schools and libraries. A sample copy and circular describing it may be obtained upon request, addressing Science Service, B and 21st Streets, Washington.—Watson Davis. (*This is one of a series of statements on opportunities for special use of publications.*)

Following Health Advice: Can They and Will They?—"Don't work immediately after eating." What is "work"? What is "immediately"? Many thousands regularly go back to what they call "work," in office or factory, after a 15 or 30 minute period for luncheon and, so far as they know, feel no ill effects. What do we expect the reader to do about it when we include the above line in a health leaflet or folder?

"The drinking of very hot or very cold water (ice water) is equally harmful and should be avoided." When is water "very hot" so that it is harmful? Is all "ice water" harmful and to be avoided?

Two questions may be raised in the interest of effective educational method: First, Can we

expect to make any impression on the habits of working right after meals and of drinking ice water by such simple statements, without at least a brief amplification explaining the probable results? Second, Is there danger of lessening the force of other suggestions as to good health habits when we insert in their midst casual warnings which are likely to arouse skepticism or give advice that appears impracticable?

The quotations given above came from east of Chicago. A health department located 500 miles farther west states that "Iced drinks are not particularly detrimental if they are taken slowly." Is there a catch in the distinction between "ice water" and "iced drinks"? To the elusive "average man" the statement from the west will make a greater appeal. Is it the wiser statement to offer?

Crowd Action Against Disease—"At the conference of State and Provincial Health Authorities of North America held in Atlantic City in May, Dr. M. M. Seymour, deputy minister of public health of Saskatchewan and president of the conference, proposed a plan for 'drives' against diphtheria, smallpox and typhoid. In brief, the scheme provides for devoting two months each during the coming year to diphtheria, smallpox and typhoid. Thus, during September and October a survey is to be made of the incidence of diphtheria, and everything possible done to educate the public concerning its nature. At the same time, immunization or vaccination of the individual will be encouraged. The plan proposed was adopted by the conference and, no doubt, will become effective within the month of September. Smallpox is to be the subject for November and December, and typhoid for January and February, 1927. The Seymour plan is obviously an attempt to apply to the prevention of disease the well established psychology of the 'drive.' Our public has been educated to 'crowd action.' In the organization, the press, the pulpit, the school and every other medium of education are to be employed. The prevention of communicable disease, even when the cause, the mode of transmission and the method of prevention are thoroughly known, is constantly obstructed by an apparently inevitable minimum of ignorance and carelessness. It may be that these factors can be overcome only by such an intensive drive as Dr. Seymour has proposed. The work will, of course, be carried on in every state and province of the United States and Canada as a separate activity of the local health authorities. Physicians will naturally coöperate in the fullest with any soundly established plan which their local authorities may initiate." *Jour. A. M. A.*, July 31, 1926.

FOLKS WE KNOW

John Armstrong has left the Cattaraugus County Tuberculosis and Public Health Association to become full-time director of the Bureau of Health Education of the County Department of Health.

Ella Cyrene Bakke, long publicity director of the Colorado Tuberculosis Association, is now Mrs. Joseph A. Dear, Jr., residing in Jersey City.

Bertrand Brown, editorial consultant to social agencies, has become assistant secretary, Milbank Memorial Fund, in charge of publications and publicity.

Teresa M. Fields, leaving the St. Louis Tuberculosis Society, is now field organizer of public health education in the Bellevue-Yorkville Health Demonstration, New York City, conducted by the Milbank Memorial Fund.

Dr. C. W. Goddard is president of the recently organized Texas Federation for Health Education.

Dr. R. G. Leland has become executive secretary of the Toledo Public Health Association.

Hannah Mitchell is now financial and publicity secretary of the New York Nursery and Child's Hospital.

"Dr. O. W. H. Mitchell, director of the Bureau of Public Health Education of the Syracuse Department of Health since its organization four years ago has resigned in order to spend a year in study abroad. The weekly bulletin of the local department originated and edited by him stands as an example of what a bulletin of this kind should be."—*Health News*, New York State Department of Health.

Joseph W. Becker is now executive secretary of the Missouri Tuberculosis Association.

George H. Craze has become field worker with the Texas Public Health Association.

Mrs. Jayne B. Kerr, long field secretary of the Illinois Tuberculosis Association, has been appointed managing director.

A. C. Mitchell is giving chalk talks at the U. S. Children's Bureau exhibit, Sesquicentennial Exposition, Philadelphia, Pa.

James A. Tobey who has been taking graduate work at the Massachusetts Institute of Technology during the summer has become affiliated as scientific director with the Borden Sales Co., 350 Madison Avenue, New York City.

DEATH OF STELLA BOOTHE

Stella Boothe, R.N., died from appendicitis, August 15, at Philadelphia, where she was in charge of an exhibit at the Sesquicentennial Exposition, prepared by her for the three national nursing associations. Miss Boothe, who was in private life Mrs. Edward Vail, of Kew Kardens, L. I., is best known for the dramatic forms of health instruction for children which she originated, among them being the Mary Gay Suit Case Theater and toys in the shape of vegetables, with amusing names and catchy verses to carry a health lesson. The "Mary Gay Stories" were published by the World Book Company.

The Museum of Hygiene, under the auspices of the Department of Hygiene of New York University of which she was assistant director, was developed by Miss Boothe in collaboration with Dr. W. H. Park, director of the department. The Museum, which consists of exhibits for the instruction of medical students and nurses, especially in matters of contagious diseases, diet and sanitation, is a unique contribution to the field of health teaching.

The impressive exhibit at the Sesquicentennial which Miss Boothe designed presents a graphic picture of nursing education, and nursing service in all its branches. In the field of graphic and dramatic methods of interpreting social and health work, Stella Boothe stood alone, bringing to her work a background of thorough training and experience in public health nursing, originality and vividness in finding means of expressing ideas, and a delightful personality which made her a successful interpreter of the exhibits which she designed.

MARY SWAIN ROUTZAHN

LAW AND LEGISLATION

JAMES A. TOBEY, LL.B.

Standard Health Laws—Lawyers have long recognized the desirability of standard or uniform laws. An association sponsored by the legal profession and known by the somewhat wordy title of "National Conference of Commissioners on Uniform State Laws" has prepared a number of standard laws, which have been adopted in varying degrees throughout the country. Thus, a uniform negotiable instruments law, a commercial necessity, is now in force in practically all the states. Recently, a committee of this conference has been working on a uniform firearms law, a matter of some significance to public health, as the general adoption of such an act might have a real influence on the mortality rate. Uniformity in state legislation is valuable, but difficult of attainment, as each state may, within constitutional limitations, adopt diverse legislation on similar subjects. Marriage and divorce laws are striking examples of this divergence, as it is literally true that an individual may be legally married in one state, but unmarried in another.

In the field of public health about the only standard legislation which has been widely adopted is the Model Vital Statistics Law, now in force in whole or in part in most of the states. A model law for the reporting of communicable diseases has not received such general recognition. Some years ago a committee of the American Public Health Association prepared a model health code for municipalities, though the scope of this does not go beyond communicable disease control. Other model ordinances relating to various phases of the public health have also been drafted and include model laws for the prevention of blindness, for mosquito control, and for the regulation of milk. There is no doubt that an extension of such activities would be desirable. A committee on model health legislation would, in fact, be a profitable venture, but such a committee should be adequately financed, so as to permit the employment of a well qualified, full-time secretary. It is to be hoped that the time may come when the American Public Health Association can have a bureau of public health law, with sufficient facilities to consider these and other important matters.

Milk Standards—Much valuable work has recently been done on the subject of the uniform legal control of milk. Under the stimulation of the United States Public Health Service, a model ordinance for milk control has been

drafted and put into operation in a number of states. A committee of the Conference of State and Provincial Health Officers has considered this standard ordinance and reports that it is not only feasible, but "vitally necessary" to secure the general adoption of such a legal standard throughout the country. This report is given in full in *Public Health Reports* for June 30, 1926, this issue also containing an admirable paper on a national program for the unification of milk control, by Leslie C. Frank, Sanitary Engineer of the Public Health Service. The revised standard ordinance is presented in the appendix to this paper. It should be read by all sanitarians and an endeavor made to procure its universal use. Most state laws authorize municipalities to pass ordinances for the control of milk supplies, as this activity is usually more of a local than a state function. In this connection there has come to our attention a milk ordinance for Minnesota cities and villages, prepared by representatives of the Division of Dairy Husbandry of the University of Minnesota, State Department of Health, State Livestock Sanitary Board, State Dairy and Food Department, and the League of Minnesota Municipalities. This ordinance is not the same as the standard ordinance of the Public Health Service, though its objectives are similar. Incidentally, it illustrates how many different agencies are concerned with the milk problem.

Bureaus other than the Public Health Service in the national government are also interested in milk control. Thus, the Secretary of Agriculture has recently published amended standards for milk products, adopted by the Food Standards Committee, which is comprised of three representatives each of the Association of American Dairy, Food, and Drug Officials, of the Association of Official Agricultural Chemists, and of the United States Department of Agriculture. These revised standards for milk products are promulgated for the guidance of officials in the enforcement of the Federal Food and Drugs Act, which is administered by the Bureau of Chemistry. The Bureau of Dairy Industry, the name of which was recently changed from Bureau of Dairying, is likewise interested in the purity of milk.

A copy of the revised standards, which define milk, pasteurized milk, condensed milk, dried milk, and various other milk products, may be obtained without charge from the Office of Information of the United States Department of Agriculture.

Apropos of the use of raw milk, the United States Bureau of Animal Industry has recently issued a statement to the effect that all forms of tuberculosis in animals are potentially dangerous to man.

National Health Departments in Foreign Countries—The present agitation for the much needed centralization of the health activities of the United States Government makes it especially interesting to note progress in the creation or extension of national ministries of health in foreign countries. Already about a dozen nations have ministries of health under the direct supervision of cabinet officers.

On June 30th the Federal Public Health Service of Germany, known now as the *Reichsgesundheitsamt*, celebrated its fiftieth anniversary. In accordance with the system of government in Germany this board has no executive powers, as these are reserved to each of the several German states, but it has important advisory duties and has coöperated in securing the adoption of necessary health laws throughout the empire and later the republic. There is also in Germany a special subdepartment of public health under the ministry of the interior, created in 1918. It is interesting to observe that, in addition to medical men, several of the directors of the *Reichsgesundheitsamt* have been jurists.

During 1925 national departments of health were established in Nicaragua and Panama, according to the *Twelfth Annual Report of the International Health Board*. Mexico passed a new Federal Public Health Code on May 27, 1926, the enforcement of this code being entrusted to the Federal Department of Public Health. The provisions of this code relating to child hygiene are given in the *Child Welfare News Summary* of the United States Children's Bureau for August 7, 1926.

Thirteen Latin-American nations had accepted invitations on September first to the first convention of Pan-American Health Directors, which was scheduled to be held in Washington from September 27th to 29th.

Conference on Accident Prevention—A conference on the prevention of industrial accidents was called by the Secretary of Labor in Washington from July 14th to 16th for the purpose of developing more effective coöperation among different organizations interested in accident prevention. Approximately 270 delegates were present from 33 states, the District

of Columbia, Canada, and Argentina. The conference was sponsored by the United States Bureau of Labor Statistics and is reported in full in the *Monthly Labor Review* issued by that bureau for August, 1926. The problem of national accident statistics was very thoroughly considered and resolutions were adopted recommending a unified standard system of reporting and distributing information, and the enactment by the states of such legislation as shall be necessary to provide for reports by employers which will allow the compilation of accident severity rates. A resolution that an annual conference be held was referred to the Secretary of Labor for action.

Federal Health Items—A report on pollution affecting navigation has recently been made by the Chief of Army Engineers, in accordance with the terms of the Oil Pollution Act of 1924. In it is the conclusion that no new federal laws are needed to cope with this situation.

The United States Public Health Service announced on August 4th that 7,000 pounds of Zyklon, a German fumigant, had been ordered for use in the quarantine stations of the country. Experiments have shown, according to the Service, that this fumigant is superior to makes produced in the United States.

The Post Office Department has issued a fraud order against F. H. Cross, operating under various trade names. Mr. Cross's little scheme was to sell two guinea pigs of appropriate sex to gullible persons, with the warranty that the numerous progeny would be repurchased by him. He assured his customers that vast numbers of guinea pigs are needed for medical and sanitary research and that there is consequently a wonderful market for them. The Post Office Department discovered, however, that these promises usually failed to materialize.

The Hall of Health of the Smithsonian Institution at Washington, D. C., is described in an article in the August, 1926, number of *Hygeia*.

Miscellaneous Matters—A querulous correspondent raises the question as to whether our phrase in the last issue of the JOURNAL that "calm and peace prevail in the national capital" should be singular or plural. The prevalence of calm and peace in the national capital is, in our opinion, a most singular situation, in every sense of the term.

About the only consideration given to the legal side of public health at the Annual Meeting of the American Public Health Association this year is a paper on "The Constitutional, Statutory and Administrative Aspects of Vital Statistics Practice in the United States" which will be presented before the Vital Statistics Section by W. T. Fales, E. W. Kopf, and the Associate Editor.

A reprint entitled "Politics and the Public Health" from the August, 1926, issue of the *Scientific Monthly* will be sent by the editor of this Section to any one interested in this subject.

The address of the editor of this Section will hereafter be c/o Borden Sales Company, 350 Madison Avenue, New York, N. Y.

CONVENTIONS

October 4–7, National Tuberculosis Association, Washington, D. C.

October 4–9, American Library Association, Atlantic City, N. J., and Philadelphia, Pa.

October 11–14, American Public Health Association, Buffalo, N. Y.

October 12, Conference of Health Officers and Public Health Nurses, Buffalo, N. Y.

October 14–16, Association of Military Surgeons of the United States, Philadelphia, Pa.

October 18–22, Playground and Recreation Association of America, Atlantic City, N. J.

October 25–27, International Association of Dairy and Milk Inspectors, Philadelphia, Pa.

October 25–27, Association of American Medical Colleges, Cleveland, O.

October 25–29, American College of Surgeons, Montreal, Quebec.

October 25–29, National Safety Council, Detroit, Mich.

October 25–31, Texas Association of Sanitarians, Fort Worth, Tex.

November 3–5, American Association of Railway Surgeons, Chicago, Ill.

November 8–10, National Municipal League, St. Louis, Mo.

November 10–14, American Country Life Association, Washington, D. C.

November 15–18, Southern Medical Association, Atlanta, Ga.

December 6–9, American Society of Mechanical Engineers, New York, N. Y.

December 27–30, American Association for Labor Legislation, St. Louis, Mo.

December 28–31, National Community Center Association, St. Louis, Mo.

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